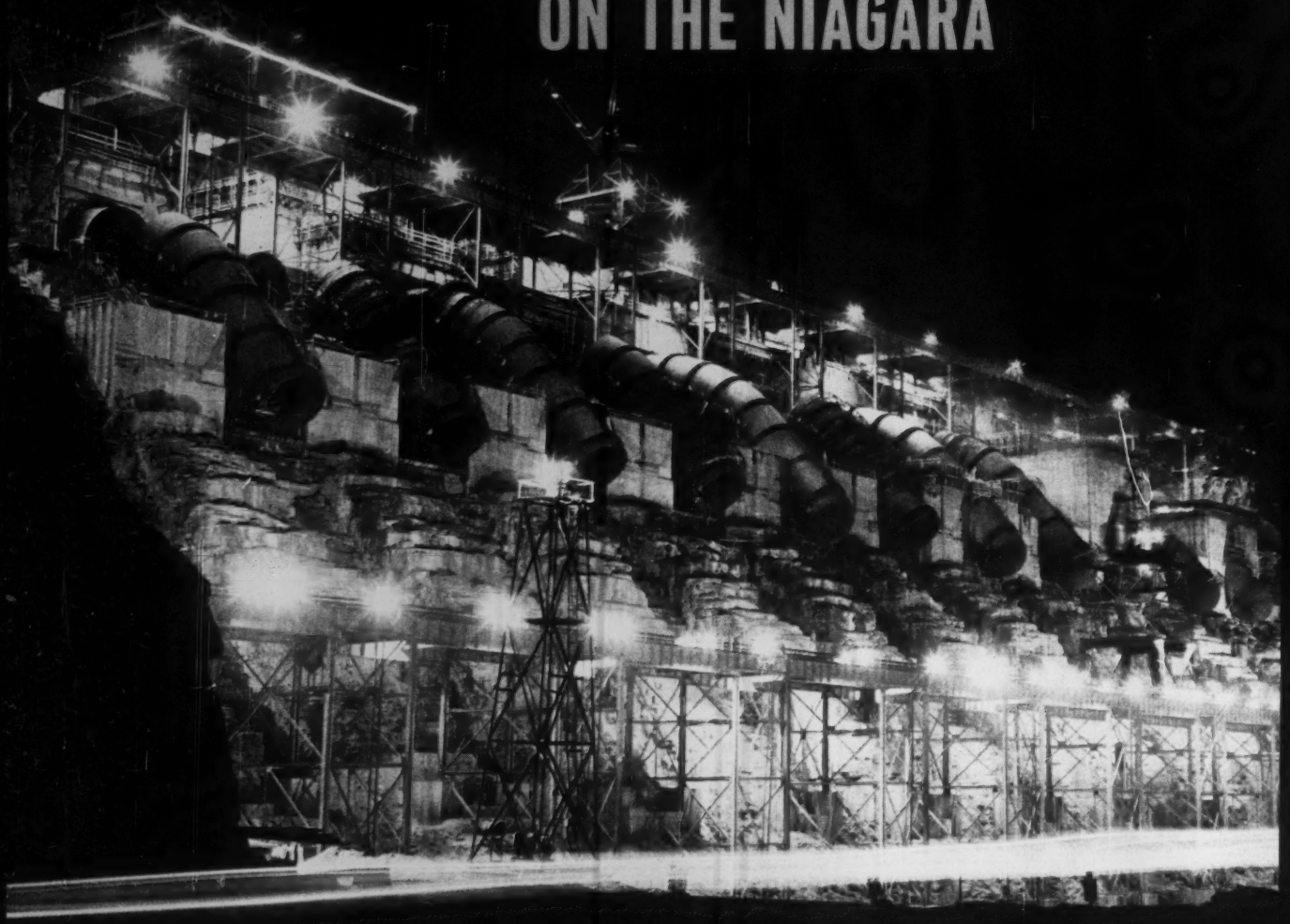
ENGINEERING NEWS-RECORD

C. F. Wertz: His water system makes money p.75

A McGRAW-HILL PUBLICATION

STEVENS RICE GS N
UNIV MICROFILMS INC EDW
313 N FIRST ST
ANN ARBOR MICH

CB&I CREATES NEW WATERFALLS ON THE NIAGARA

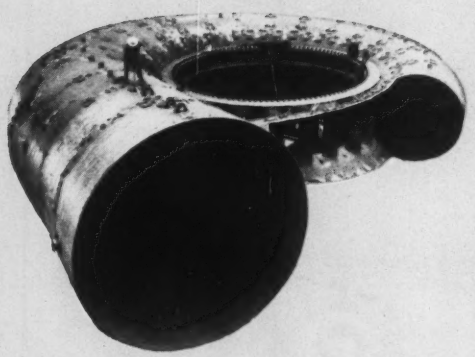


E67CB

28 ft. diameter penstocks at Niagara Station near Lewiston, N. Y.

CB&I is constructing 25 penstocks for the gigantic Niagara Power Project of the New York Power Authority. These huge structures will rechannel a portion of the rushing Niagara River into the 25 scroll cases being erected by CB&I. The man-made waterfalls will energize one of the free world's largest hydroelectric plants.

CB&I's role in this vast construction project utilizes the *coordinated services* that have built an enviable world reputation for our company. The result is *Creative Craftsmanship in Steel.* Let us tackle your task in the same efficient manner.



Giant scroll case dwarfs workman during "fitting-up" operation at CB&I's Greenville, Pennsylvania plant.

CHICAGO BRIDGE & IRON COMPANY

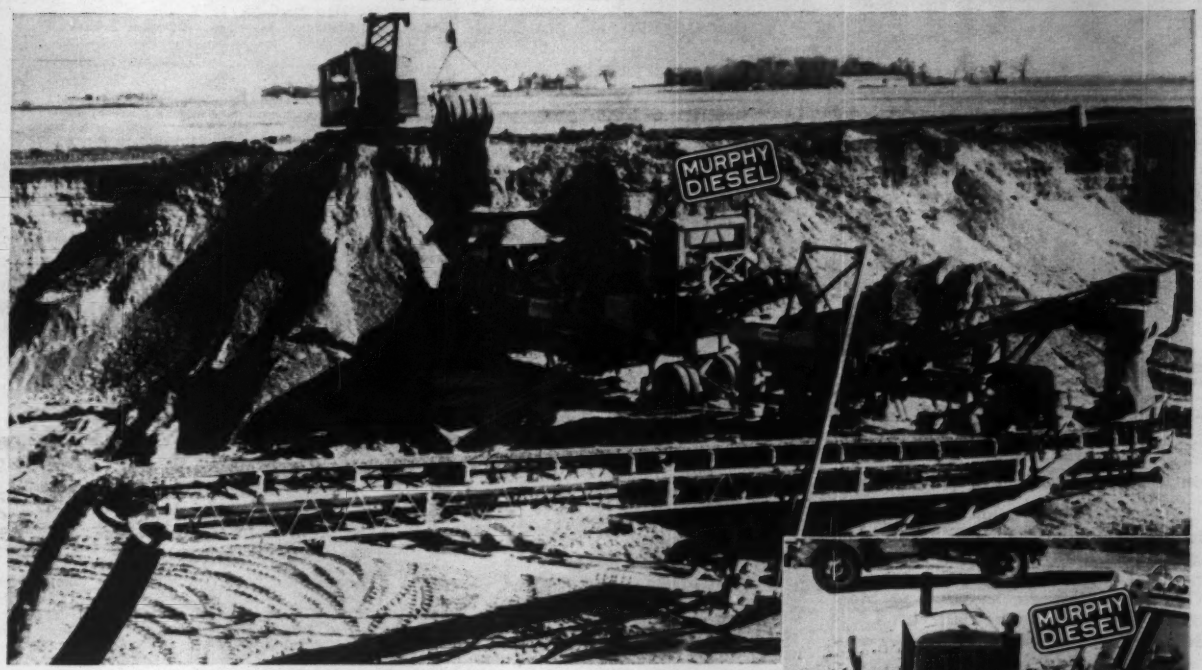
332 SOUTH MICHIGAN AVENUE
CHICAGO 4, ILLINOIS

OFFICES AND SUBSIDIARIES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

HERE'S HEAVY-DUTY WORKING POWER BY

MURPHY DIESEL

FOR A 2-MILLION TON PER YEAR AGGREGATE PLANT



A 133 HP (continuous) Murphy Diesel powers a Cedarapids Commander crushing plant in Larson's George Pit, near Joliet, Ill. This plant produces approximately 2200 tons of road aggregate per day.

Elmer Larson, Inc., of De Kalb, Illinois, one of the Midwest's largest aggregate producers, has produced around 25 million tons in the past 30-odd years. Owners Elmer and Leon Larson know the value of equipment that is engineered for *hard work*, with dependability and economy. That's why they chose Murphy Diesel power for the plants shown here.

Murphy Diesels give you the kind of *usable, hard-working* power you need, delivered into the job. Murphy power takes hold of a load and really hangs on. Murphys' good lugging power is the result of high rising torque. This helps keep your equipment at the right operating speed for efficient production and more profit. And Murphys get every ounce of power out of every drop of fuel. When you see your Murphy Diesel Dealer for proof, ask about low maintenance and economical operation, too.

At the Sears Pit, Sycamore, Ill., a 203 HP (continuous) Murphy Diesel powers a Cedarapids Double Impeller Impact Breaker primary. This pit produces 1700 tons per day of road rock, aglime, concrete aggregate, and stone chips.

430-R

MURPHY DIESEL

PUTS MORE POWER INTO THE JOB

MP Series Murphy Diesel engines and power units are available in sizes from 105 to 320 HP with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 60 to 188 KW.

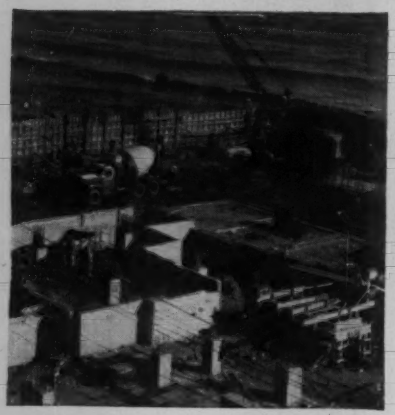
MURPHY DIESEL COMPANY

5321 W. Burnham St., Milwaukee, Wisconsin

SALES . . . PARTS . . . SERVICE

Throughout the Nation

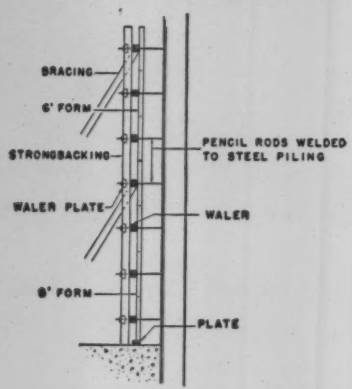
12¢ a Square Foot



Best Method to Pour 750 Ft. Retaining Wall

Symons Forms, Sheet Piling and Pencil Rod Ties

How to pour a 750 foot lake retaining wall with thickness from 12 to 20 inches and 13 ft. high, faster and more economical. S. N. Nielsen Construction Company, Chicago, had that problem on a 600 unit apartment on Lake Michigan shoreline. Since a fixed core



could not be obtained while using sheet piling only, the superintendent used Symons Steel-Ply Forms with sheet piling and pencil rods as ties.

Was this method a success? After 250 feet of wall had been formed, poured and stripped, the forming costs were computed at 12 cents a square foot.

Contractors are finding almost as many uses for Symons Forms as there are jobs to bid on. It will pay you to send for our FREE form literature. And Symons Forms can be rented with purchase option.

Symons

SYMONS CLAMP & MFG. CO.

4265 Diversey Ave., Dept. EO, Chicago 39, Ill.

MORE **SAVINGS** FROM **SYMONS**

ENGINEERING NEWS-RECORD

EIGHTY-SIXTH YEAR OF PUBLICATION

ABP ABC MEMBER

Editorial Offices, 330 W. 42nd St., New York 36, N. Y.
New York- LOngacre 4-3000; Chicago - MOhawk 4-5800; San Francisco - DOuglas 2-4600
Washington - REpublic 7-6630

Editor, Waldo G. Bowman

Managing Editor, **Arthur J. Fox, Jr.**

Senior Editor, **Frederick S. Merritt**

Highways, Airports—Transportation
Leo J. Ritter, Jr., Edward M. Young, Jr., Joseph F. Wilkinson

Buildings, Bridges—Structures
David B. Hill, Marianne Stern Friedland, C. W. Griffin, Jr.

Rivers, Sanitation—Water Resources
James B. Sullivan, William W. Jacobus, Jr., Marie Zanfardino

Finance, Labor—Management
Robert J. Stinson, Charles J. Harding

Regional Editors
J. Roland Carr, *Chicago, 520 N. Michigan Ave.*
Martha Alexander, *Staff Assistant*
Lauress L. Wise, *San Francisco, 68 Post St.*

Copy—Production
Irwin Landau, Nancy Parkes, John C. Greenough, Robert M. Echols

Presentation
Harry W. Jensen, Robert G. Young

Correspondents, Bureaus
Leah Shanks

Statistics, Prices, Costs—Business News
Elsie Eaves, *Manager*
Julia Mahoney, *Construction Reports*
Mildred Wetzel, Marian Sciorra, Marie Moravsik, Elaine Chomyak, Elizabeth Werra, Eleanor Queret
James Webber, Ruth Carlson, *Economics*
William P. Larkin, *Prices, Wages, Indexes*
Evelyn Huber, Charlotte Foster, *Statistics*
Bertha Herrmann, *Unit Prices*

Editorial Research and Indexing
Eva Gierat, Rene Hay, Jane Jacobson

Consulting Editors: **Van Tuyl Boughton, Nathan A. Bowers**

Advertising Sales Manager: **Donald S. Robertson**

Circulation Manager: **Edward F. Bressler**

Washington Bureau, National Press Bldg., Washington 4, D. C., George B. Bryant, Jr., Chief, Alan Adams, Glen Bayless, Roy Calvin, Anthony DeLeonardis, John Donaldson, Jay Flocken, Boyd France, Donald Loomis, Gladys Montgomery, Arthur Moore, Seth Payne, Dean Reed, Morton Reichek, Caroline Robertson, Vincent Smith.

Domestic News Bureaus: Atlanta—801 Rhodes-Haverty Bldg., B. E. Barnes, Chief, Frances Ridgway; **Chicago**—520 N. Michigan Ave., Stewart Ramsey, Chief, Bruce Cross, Lois Dubin; **Cleveland**—55 Public Square, Arthur Zimmerman, Chief, Violet Forsha; **Dallas**—901 Vaughn Bldg., Marvin Reid, Chief, Lorraine Smith; **Detroit**—856 Penobscot Bldg., Donald MacDonald, Chief, Sally Ayling, Wesley Perry, Jr.; **Los Angeles**—1125 W. 6th St., Kemp Anderson, Jr., Chief, Michael Murphy, Jack Meyer, Marvin Petal; **San Francisco**—68 Post St., Jenness Keene, Chief, Donald Winston, Alison Lunt; **Seattle**—6040 Fifth Ave., N.E., Ray Bloomberg.

Foreign News Bureaus: London—John Shinn; **Paris**—Robert Farrell; **Mexico City**—Peter Weaver; **Bonn**—Morrie Helitzer; **Beirut**—O. M. Marashian; **Tokyo**—Sol Sanders; **Rio de Janeiro**—Leslie Warren; **Caracas**—John Pearson; **Moscow**—Ernest Conine.

Correspondents: In 70 principal U. S. cities and 70 cities throughout the world.
Director of News Bureaus: John Wilhelm; Managing Editor, **Margaret Ralston.**
McGraw-Hill Economics Department: Dexter M. Keezer, Director.

Publisher, Robert F. Boger

ENGINEERING NEWS-RECORD, Vol. 164, No. 19, MAY 12, 1960

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Publication Office, 99-129 North Broadway, Albany 1, N. Y. See panel below for directions regarding subscriptions or change in address. **Executive, Editorial, Advertising and Circulation Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction and building. Position and company connection must be indicated on subscription orders.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20 per year, payable in advance. Second-Class mail privileges authorized at Albany, New York. Printed in U.S.A. Title registered in U.S. Patent Office.

©Copyright 1960 McGraw-Hill Publishing Co., Inc. All Rights Reserved.

UNCONDITIONAL GUARANTEE: We agree, upon request to our New York office, direct from paid-up subscribers, to cancel any subscription if ENGINEERING NEWS-RECORD's editorial service is unsatisfactory, and will refund the proportionate subscription price of any unmailed copies.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Fulfillment Manager, ENGINEERING NEWS-RECORD, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify, publisher *promptly of any change of address, giving old as well as new address, and including postal zone number,* if any. If possible enclose an address label from a recent issue of the magazine. Please allow one month for change to become effective.

Postmaster: Please send Form 3579 to Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

"WE'VE GOT TO GET IT DONE!"

Stuff like this takes a REAL ROCK SHOVEL!

On visits to jobs to get the real story of Northwests at work we often find many machines. It is no accident that almost invariably a Northwest is pioneering in the heaviest digging—the rock digging! "Why", we ask, "do you choose the Northwest for the rock work?" Always, the answer is the same, "We've got to get it done!"

Watch a Northwest Shovel at work in rock! The Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste. The swing is smooth. The load is spotted in one clean move. It's in the truck and the dipper is back in the bank.

Hour after hour—day after day—yard after yard, that's what makes production. Your Northwest is always ready to go. *We hear it everywhere and Northwest users will tell you so.* The "Feather-Touch" Clutch Control makes operation easy without resorting to pumps, compressors and other delicate mechanisms. The Cushion Clutch eliminates the detrimental effects of shock loads and makes ample power safe. It brings you a combination of advantages that has proved its ability to get high output in rock and make easy digging easier. It gets things done!

NORTHWEST ENGINEERING COMPANY
1502 Field Building, 135 South La Salle Street
Chicago 3, Illinois

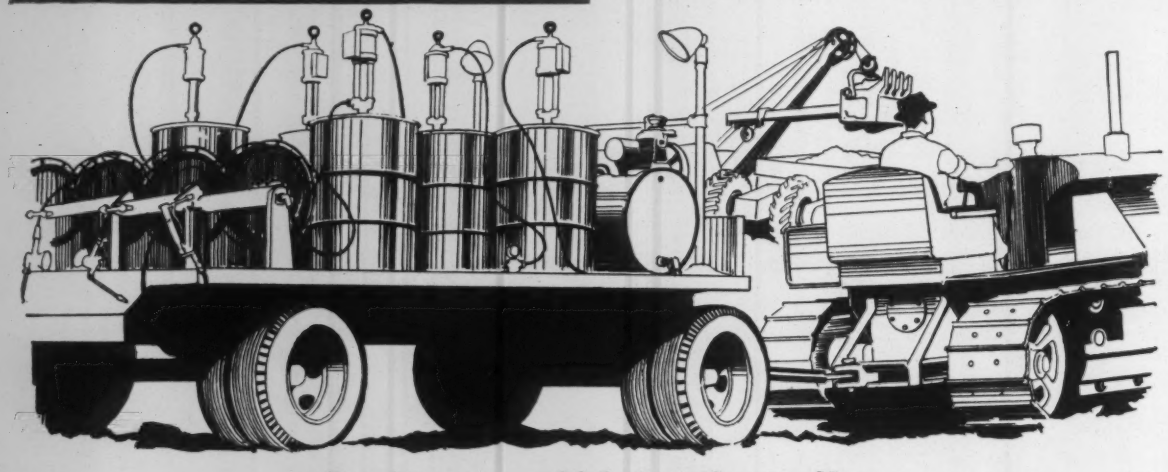
NORTHWEST *Always Ready to* GO

S-80-89-L

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 60-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

LUBE LOGIC Tips for more



Do-it-yourself lube rig trailer

Maybe you're aware of all the advantages of a mobile lube rig, but just don't want to tie up a truck for this purpose. Or, perhaps you'd like a supplementary rig. You can solve either problem neatly by mounting your field lubricating equipment on a standard 5-ton farm trailer. That way, you can take your whole simplified lube plan out into the field where it's needed, without costly deadheading back to a fixed service point—and you can move the lube rig just by hitching it to any truck, so it's just as mobile as a truck mounted rig at much less cost. And here's a bonus: by hitching your lube rig trailer to a bulldozer, you can take field service to spots that wouldn't be accessible to a regular truck.

Trailers for this purpose, as well as tanks and pumps, are all standard items you assemble yourself to meet your own requirements.

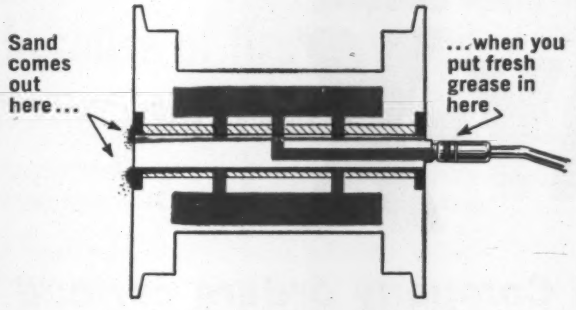
TEXACO LUBRICATION ENGINEERS ON THE JOB FROM COAST TO COAST

ROCKY REACH DAM AND POWERHOUSE on the Columbia River, Washington (above). W. N. Evans (left), Manager for Rocky Reach Contractors, discusses Simplified Lubrication Plan with E. S. Saunders, Texaco Contractor Sales Representative.

HOGBACK DAM, Riverton, Conn., (upper right) is part of the greater Hartford water supply system. Texaco man-on-the-job is H. F. Porter (left) shown with John Toffolon, Vice President, White Oak Contractors, Inc., General Contractors.

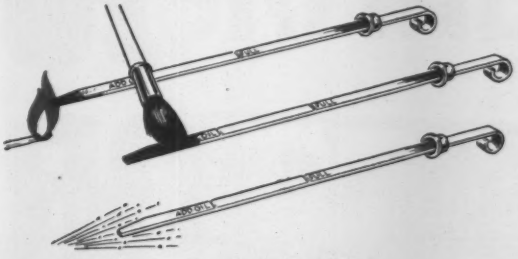
INTERSTATE HIGHWAY 80 PROJECT at Colfax, Iowa (right). Texaco Engineer E. A. Howles (right) works closely with Mott Construction Company on the important assignment of keeping equipment on the job and maintenance costs low.

efficient maintenance



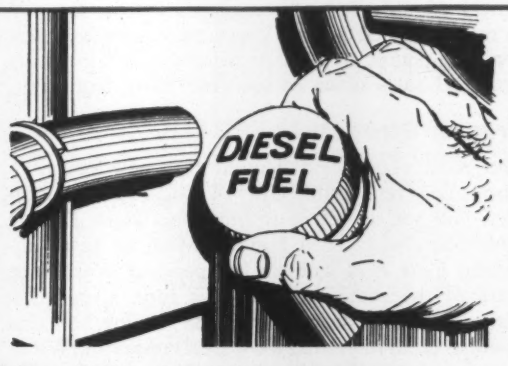
Track-roll enemy No. 1: sand

If you're operating a crawler-tractor in sandy soil, the best way to keep sand from getting into the track-roll bearings is to keep purging the bearings with fresh grease. Track-roll bearing seals are especially designed for this type of purge-lubrication, and the grease that comes out around the edges of the seal during lubrication carries the sand out with it.



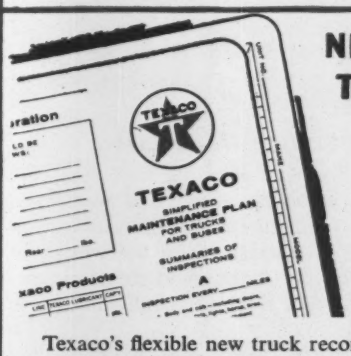
How to read dipsticks without squinting

The modern inhibited motor oil that keeps the inside of your engine clean also keeps the oil dipstick clean—and often too shiny to read. Here are three solutions for this problem—take your choice. 1. Heat the end of the dipstick so the metal darkens slightly. 2. Paint the end of the stick with a dull-finish cellulose lacquer. 3. Run the stick across the spark-plug cleaner to take off some of the shine. (If you use the spark plug cleaner, use the smallest rubber plug bushing and hold the dipstick over the hole with a wad of cloth to keep sand from scattering around the lube bay.)



Identify the fuel you want

Let one absent-minded maintenance man put gasoline in your diesel tank and as the fliers say "you'll be bailing out over Denver." It's happened. Best way to avoid its happening to *you* is to mark your fill cap "Diesel Fuel" or "Gasoline". Then nobody should make any mistakes.



NEW TRUCK RECORD FOLDER fits itself into your schedule

Texaco's flexible new truck record folder lets you stick to the lube schedule that works best for you without running into bookkeeping problems. Lubrication and oil schedules are completely separate from mechanical maintenance and replacement parts schedule—you don't have to follow any pre-established routine to use the folder profitably. And this new folder accounts for every single dollar you spend on truck maintenance for a whole year. Write for your folders today.

TEXACO LUBRICATION ENGINEERS

Every month we'll bring you a batch of "sleepers", little angles, so easy to overlook, where big savings in money and time can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control."

Texaco Inc., 135 East 42nd Street, New York 17, N.Y.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

TEXACO

Throughout the United States

Canada • Latin America • West Africa

Interim Progress Report on CF&I-Wickwire's new wire rope

DOUBLE GRAY-X®

Falcon Seaboard Drilling Company orders carload

The first company to use a prototype of Double Gray-X was the Falcon Seaboard Drilling Company of Tulsa. Aware that modern drilling practices demand the best possible equipment, Falcon Seaboard tested Double Gray-X on some of their rotary drilling rigs, an operation that subjects ropes to extreme abuse. Mr. Jack Starr, Vice President in Charge of Drilling, commented, "The results obtained from original tests with Double Gray-X prototype led to our decision to order *a carload of this improved product*. Falcon Seaboard insists on the best products, in order to serve the oil industry in accordance with today's modern standards."

The Secret of Longer Rope Life

CF&I-Wickwire engineers, after intensive research, discovered that by using an entirely new wire drawing technique—including the use of Molysulfide* in the lubricant—the characteristics of the wire rope were greatly improved. This method creates a permanent molecular jacket around the individual wires that provides these benefits:

- **reduced friction between the individual wires in each strand of Double Gray-X during service**
- **minimized surface imperfections in the wires of Double Gray-X**
- **wires have greater resistance to abrasion, crushing and bending**

If you are a user of wire rope, you can *increase* the safety of your operation and *reduce* equipment downtime with Double Gray-X. Made in a wide variety of sizes and constructions, Double Gray-X is recommended for all types of equipment. For complete details on this new wire rope, call the nearest CF&I sales office or see your local distributor.

Greater Strength

The molecular shield around this new premium wire rope gives Double Gray-X longer life. In addition, you get the *extra strength* for which Double Gray has always been famous. Made of extra improved plow steel with an Independent Wire Rope Core of the same material, this rope gives 15% higher breaking strength than the catalog breaking strength of an improved plow steel rope with IWRC.

*Registered Trademark of Climax Molybdenum Co.

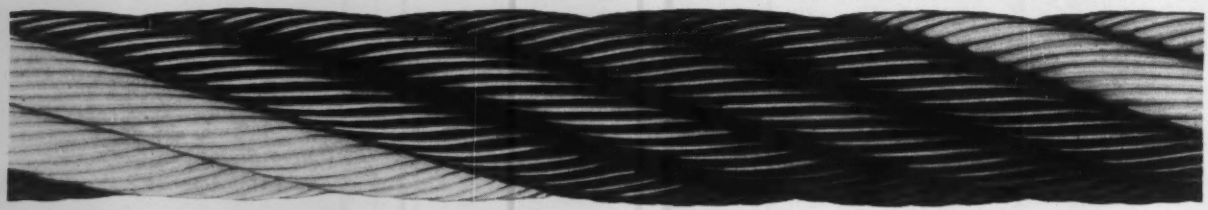
7623-A

CF&I STEEL **WICKWIRE ROPE**

THE COLORADO FUEL AND IRON CORPORATION

In the West: **THE COLORADO FUEL AND IRON CORPORATION** — Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Odessa (Tex.) • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Tulsa • Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New Orleans • New York • Philadelphia



BIDS DON'T BACKFIRE

because of tire troubles... with Goodyear on the job

FINDING THE WORK FACTORS—Goodyear Big-Tire Specialists will analyze the problems of terrain, loads, climate, roads, schedules, speeds—everything that bears on tire needs and costs.

Then, from a complete line of *the world's toughest earthmover tires*, they'll recommend the most efficient and lowest-cost tire to do each job right. These tires, with a super-tough body built with 3-T Nylon Cord and specially compounded tread rubbers of unequaled toughness, cope with tremendous loads, endless flexing, cutting and chipping dangers—provide amazing durability.

PUTTING BIG-TIRE KNOW-HOW TO WORK—From the world's greatest fund of experience, Goodyear Big-Tire Specialists are uniquely qualified to help you. And they'll provide the best in tread and body designs to help safeguard your contract and your profits.

SETTING UP BIG-TIRE SERVICE—Goodyear Big-Tire Specialists will complete your tire-performance insurance by lining up, and even operating, a tire-maintenance program to save you BIG MONEY in man-hours, machine-hours and useful tire life. If necessary, Goodyear contractor service will travel with your job—handle all your tire maintenance and repairs.

With BIG TIRE PERFORMANCE
Example: SUPER HARD ROCK LUG

Here's a typical Goodyear big tire for big jobs—the new Super Hard Rock Lug (pictured). This wide-base off-roader has a new "square" shoulder design with extra-thick rubber for terrific traction bite and longer wear. Yet its cost is the same as ordinary wide-base tires.

Get in on all this—see your Goodyear dealer now! Or write Goodyear, Truck Tire Dept., Akron 16, Ohio.

WORLD'S TOUGHEST EARTHMOVER TIRES BY

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

LOADED *with Savings!*

Mobilgrease MP in the convenient cost-cutting cartridge!

SAVE... ONE GREASE FOR A HUNDRED JOBS!

Mobilgrease MP is a *multipurpose* lubricant, an automotive grease that gives full protection to wheel bearings, universal joints, steering linkage, water pumps and other grease-lubricated chassis parts. With one multipurpose lubricant you reduce storage and inventory problems, eliminate misapplication.

SAVE... DISPOSABLE CARTRIDGE CUTS COSTS AND TIME!

There's no waste with Mobilgrease MP in this convenient, clean-handling cartridge. No changing guns, no wasted moves . . . greasing time is reduced. Cartridge protects grease from contamination, helps you get full value for your lubricant dollar. Contact your Mobil Representative.

PLACE THIS END IN GUN FIRST
A Mobil Product
To Load Cartridge-type gun, see directions accompanying gun. For Other Methods, start using from top — cut tube along dotted lines to maintain accessibility as grease is used.
Mobil
Mobil

Another way Mobil saves you time and money!

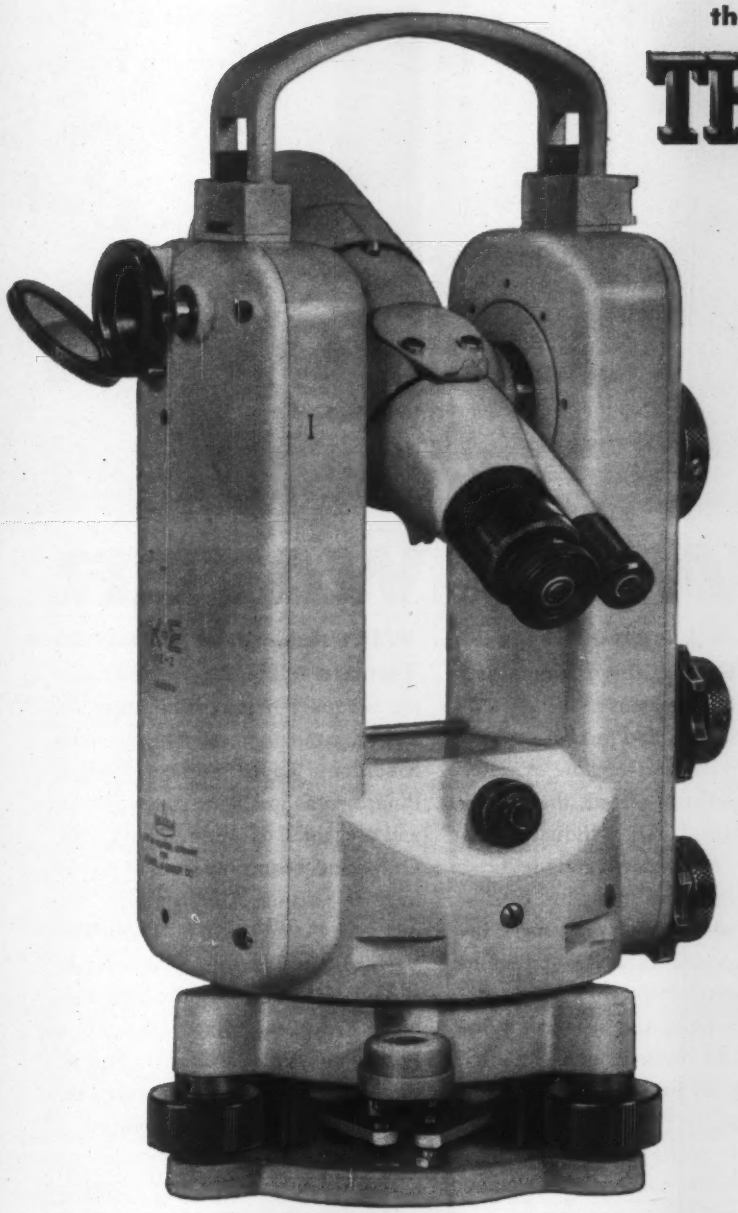
MOBIL OIL COMPANY
150 East 42nd Street, New York 17, N. Y.

Engineered
For American Practice

the brilliant, new, MODEL KE-2

THEODOLITE

by K+E



Ideal for triangulation and traverse up to and including second order. Excellent for making astronomical observations and for precise surveys of all types. Reading direct to one second, with estimation to 0.1 second.

Here, at last, is a theodolite specifically designed to conform to *American* and *Canadian* surveying practice—the brilliant, new KE-2. Prompted by an extensive survey to determine what the engineer and surveyor needed in a theodolite, this directional theodolite incorporates seven major refinements—a combination exclusive with K&E:

Automatic indexing of vertical circle . . . Pendulum system eliminates need for vertical control level, assures accurate vertical angles. • **Choice of erected or inverted image** . . . with either, telescope plunges through both objective and eyepiece ends. • **Leveling head joint system** . . . ball and socket linkage prevents shift between plates, gives instrument a permanently rigid leveling base. • **All control knobs located on one side** . . . for rapid, one-hand operation. • **Simultaneous viewing of both circles** . . . provides faster, easier reading, eliminates the need to switch-over from one circle to the other. • **Optical plummet built into the alidade** . . . affords easy checking simply by rotating 180°. • **Fully interchangeable accessories** . . . designed to work with all K&E Theodolites, eliminating costly duplication.

Also available:

Model KE-1, reading direct to 20 seconds . . . and Model KE-6e (Optical Transit), reading direct to 1 minute.

Keuffel & Esser Co. Theodolites are designed and built to K&E specifications by Askania-Werke of Germany.

For further information, contact your nearest K&E dealer, or fill out and mail the coupon below.

K+E

KEUFFEL & ESSER CO.

NEW YORK • HOBOKEN, N. J. • DETROIT • CHICAGO
MILWAUKEE • ST. LOUIS • DALLAS • DENVER
SAN FRANCISCO • LOS ANGELES • SEATTLE • MONTREAL

KEUFFEL & ESSER CO., Dept. ENR-5, Hoboken, N. J.

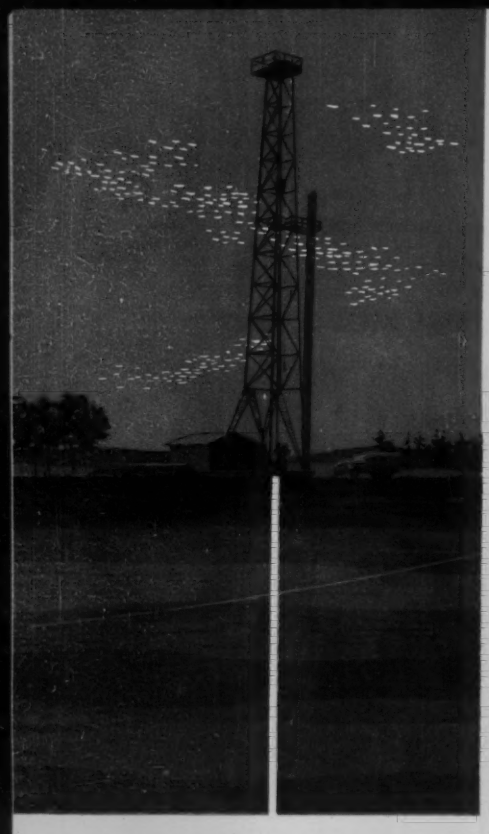
Please send me complete details on the KE-2 and other model Theodolites by K&E.

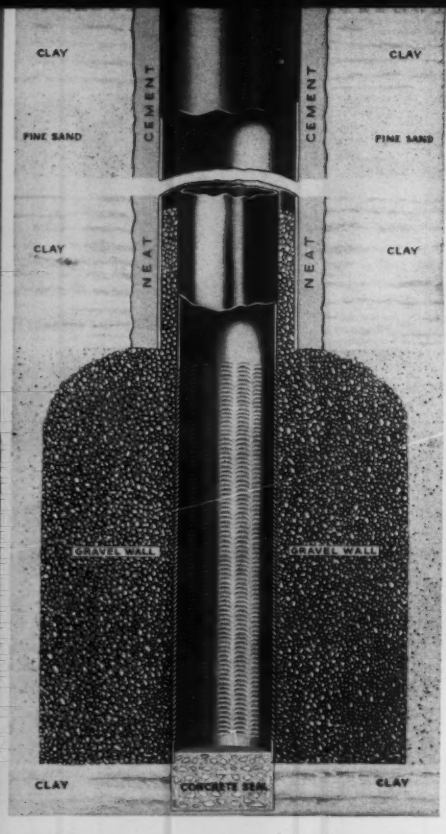
Name & Title_____

Company & Address_____

_____

1534





WATER WATER WATER

With A Layne Drilled Well Layne knows where the water-bearing formations are located. They have been drilling wells for over 75 years. This experience comes from searching and researching water aquifers. Knowing *where* to drill is half of the success—knowing *how* is the other half. In drilling a straight well experience counts—and you can count on Layne. Layne specializes in water well drilling. To get a good start for a water supply—you need a good well. You get a good, producing well when you specify a Layne drilled well. *Bulletin No. 100*

With A Layne Gravel Wall Well This technique and resulting arrangement of the new 134 Shutter Screen and gravel (shown here) permits the free flow of water into the well and affords the following advantages: larger shutter screen openings, reduced friction, reduced draw down and pumping head—thereby reducing pumping costs, increased specific capacity and more effective retention of native sands. Cemented wells are installed if indicated, and result in greater purity of supply as well as increased life of the well. *Bulletin No. 900*

With A Layne Vertical Turbine Pump Whatever the pumping requirement, there's a Layne pump to meet any pumping conditions. Layne Vertical Turbine Pumps come in a wide range of sizes and capacities, delivering 30 to 20,000 GPM and requiring from 4 to 42 inch well casings. The complete line of Layne Pumps include: Deep Well Vertical Turbine (oil or water lubricated), Short Coupled Vertical Turbine, Propeller, Mixed Flow, Fire Pumps and Volatile Liquids Pumps, Regular and "In-Line" Submersible. *Bulletins No. 200 (oil) 201 (water)*

LAYNE OFFERS COMPLETE WATER SERVICE: Initial surveys • explorations • recommendations • site selection foundation and soil-sampling • well drilling • well casing and screen • pump design, manufacture and installation construction of water systems • maintenance and service • chemical treatment of water wells • water treatment—all backed by Layne Research. Layne services do not replace, but coordinate with the services of consulting, plant and city engineers.

Visit our booth A-47-48, AWWA National Convention—Bal Harbour, Florida—May 18-20

Layne SINCE 1882

WORLD'S LARGEST WATER DEVELOPERS

LAYNE & BOWLER, INC., MEMPHIS

Offices and Factory—Memphis 8, Tenn.

LAYNE ASSOCIATE COMPANIES THROUGHOUT THE WORLD

Sales Representatives in Major Cities

Dam Design Competition Rued

SIR—Concrete arch dams, where feasible, are sometimes preferred over other types for two main reasons: (1) economy in materials and (2) comparatively greater safety and reliability (since hardly any arch dams are known to have failed structurally).

The latter argument has become less tenable because of the failure of Malpasset Dam (ENR Dec. 10, 1959, p. 24).

Although fracture of rock in the left abutment has been established as the cause of the failure by the investigating experts and nothing faulty was established about the arch barrel itself (ENR Apr. 7, p. 25), it does not necessarily mean vindication of a theory of arch dam design. The dam and its foundation are parts of an integral structure, and failure of one part is a failure of the whole.

Collapse of this presumably well-designed structure is likely to disturb the peace of mind not only of those who live downstream from dams, but also of engineers engaged in dam design and construction.

Evolution in the design of arch dams has overcome much of the characteristic complexity with the result that arch dams today are generally thinner than those of 30 years ago. However, this evolution has not been marked by harmony among the engineers responsible for it. Claims and counterclaims on behalf of various concepts, methods, "philosophies," and even shapes of dams have often been biased. Irrelevent and padded statistics have sometimes been used to establish one kind of record or another.

While the progress of the past three decades cannot be belittled, it is quite appropriate to ask if this atmosphere of controversy has been entirely healthy to arch dam design. Some designers, in their enthusiasm to outdo the others, have perhaps sacrificed safety of structure to economy of materials. Perhaps it is technically injudicious to presume that unreinforced cement concrete in hydraulic structures will perform up to theoretical expectations under very small tolerances. It should be remembered that an indeterminate structure such as an arch dam can be claimed to be adequately stable, and cannot be proved otherwise, up to the very time of its failure.

The evolution of arch dam design has given rise to some rather extravagant claims and dogmatic engineering hypotheses. Statements are often heard to the effect that it is almost impossible for an arch dam to fail structurally; or that it can be built on any type of foundation; or that the more flexible the arch the better the distribution of stresses; or that failure of the arch can take place only by crushing of concrete. Another belief is that tensile stresses, even when high enough to result in cracking, can be safely allowed anywhere in an arch dam. All these premises are only partly correct, and then often only within narrow limits.

Since the purpose of such concepts is to justify economy in volume of an arch dam, it is highly desirable that the limitations be kept in mind, especially when designing structures as thin as the Malpasset.

If high tensile stresses occur at the upstream face of a very thin dam, the progressive cracking may well be the basic cause of ultimate rupture rather than the high compression in the arches. Large abutment movements would tend to increase the tension and could thus trigger cracking and even sudden rupture.

Therefore, it would be significant to review the safety margin of Malpasset Dam on the basis of tensile stresses occurring in the structure rather than the maximum compression.

It is possible that the factor of safety of very thin arch dams against cracking and eventual rupture due to tension is rather small, especially since in a thin structure there is less concrete to crack and allow for adjustment of stresses. It should make engineers ponder whether a design is truly an advance when it shows great economy in concrete and allows unusually high compressive stresses, but considers the influence of high tensile stresses insignificant.

While ingenuity and daring often go hand in hand in dam design and deserve acclaim and appreciation, caution and assurance of stability of the structure are never old-fashioned requirements. Where life and property are at risk below a dam, the consideration of safety takes precedence over economy or the engineers' design concepts. It is very desirable indeed, that the designer's daring should be tempered by what could be endangered below the dam and how much is at stake in and above it. The larger the stakes, the greater should be the margin of overall safety.

G. S. SARKARIA
Supervisory Engineer
International Engineering Co., Inc.
San Francisco, Calif.

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

IGLOO
solves your on-the-job thirst problems

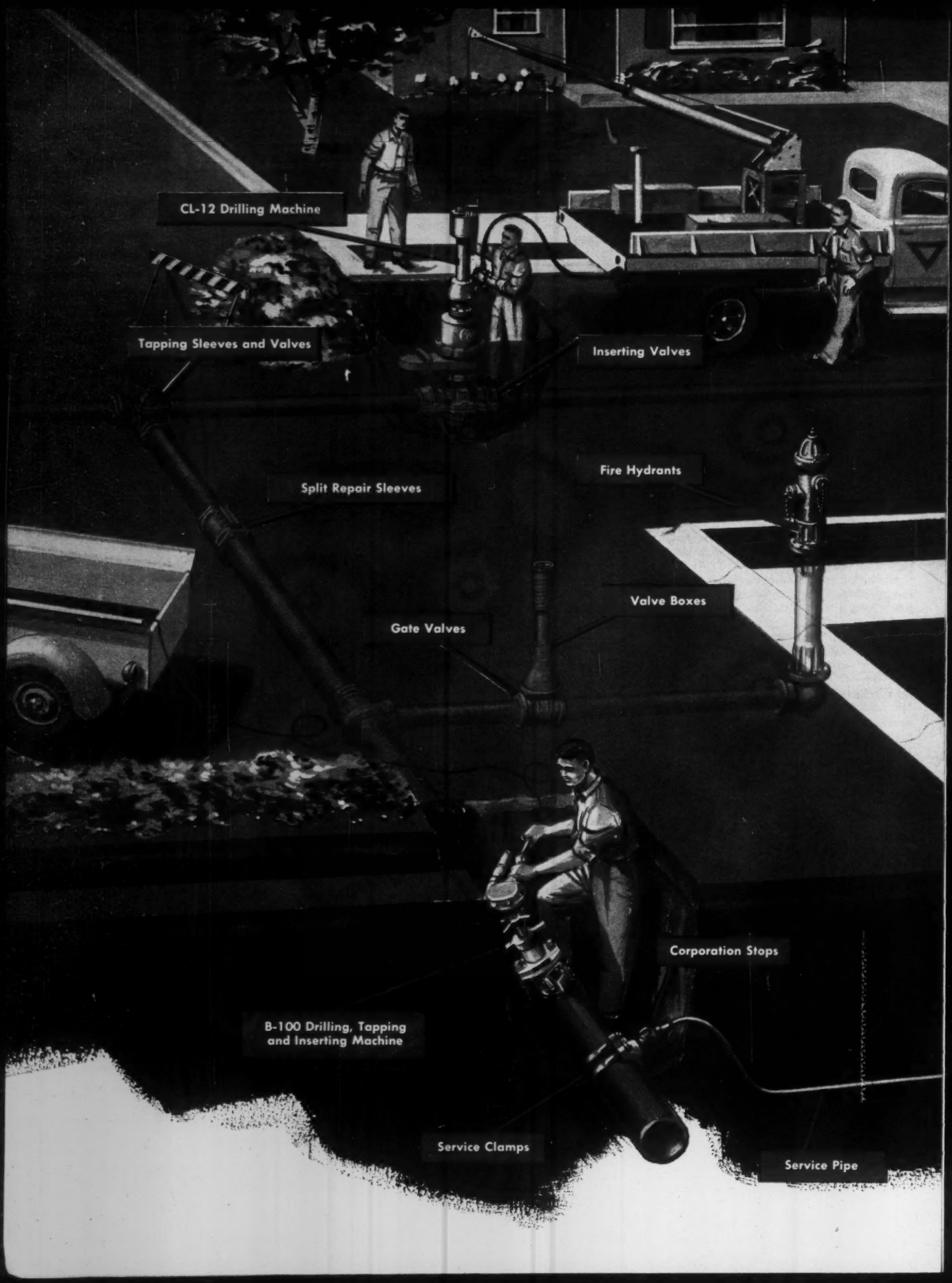
By strategically placing IGLOO Water Coolers about the job (one for every 6 or 8 men) you will have less "watering time" and more work. IGLOO's built-in cleanliness pays off in employee relations, too.

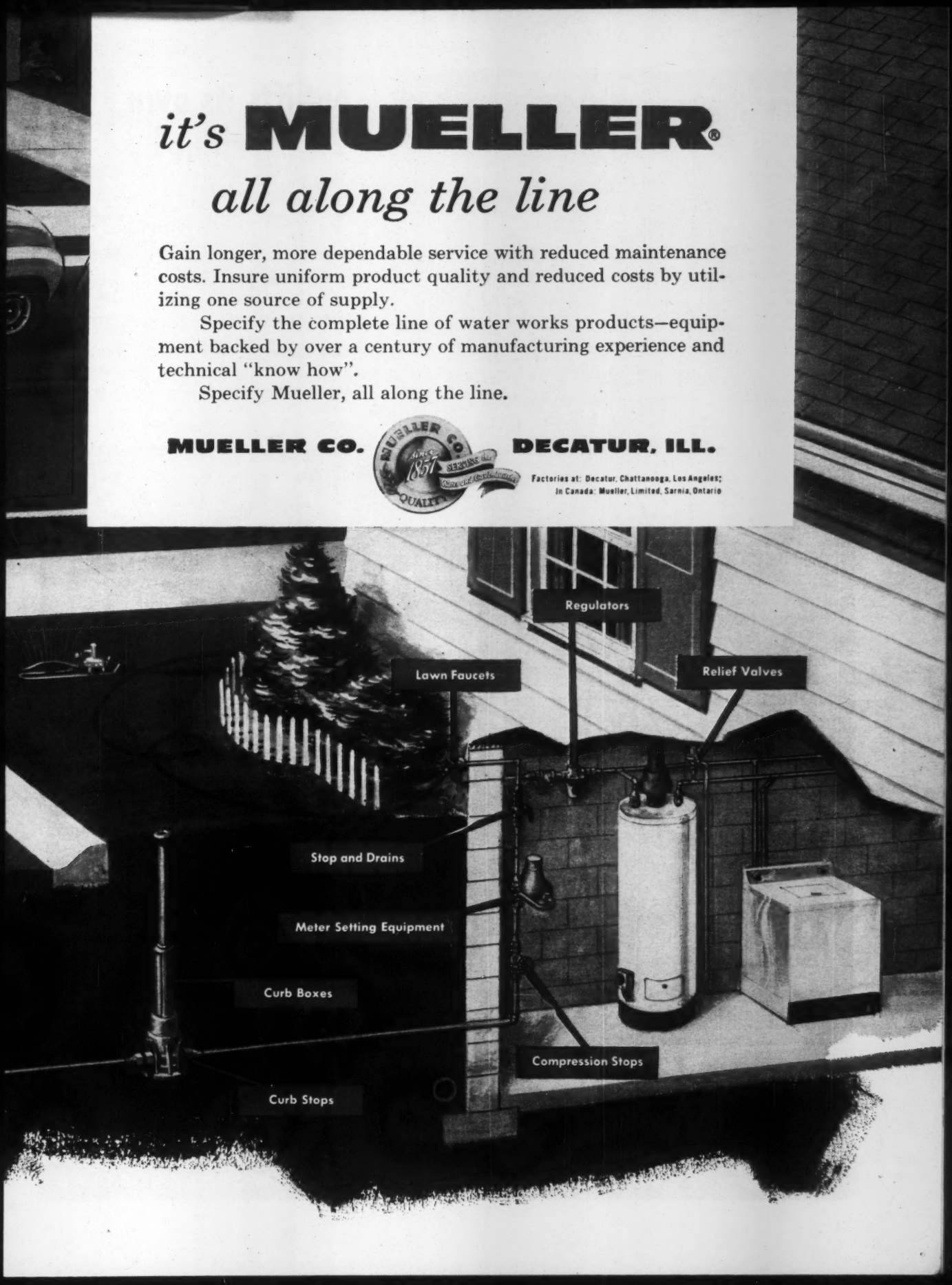
When you order water coolers, specify ***IGLOO*** *because:*

- It's been proven in use—thousands of times
- It's PERMALINED and has easy-to-clean, round inside bottom
- It's corrugated for greater strength
- Its recessed spigot won't be knocked off

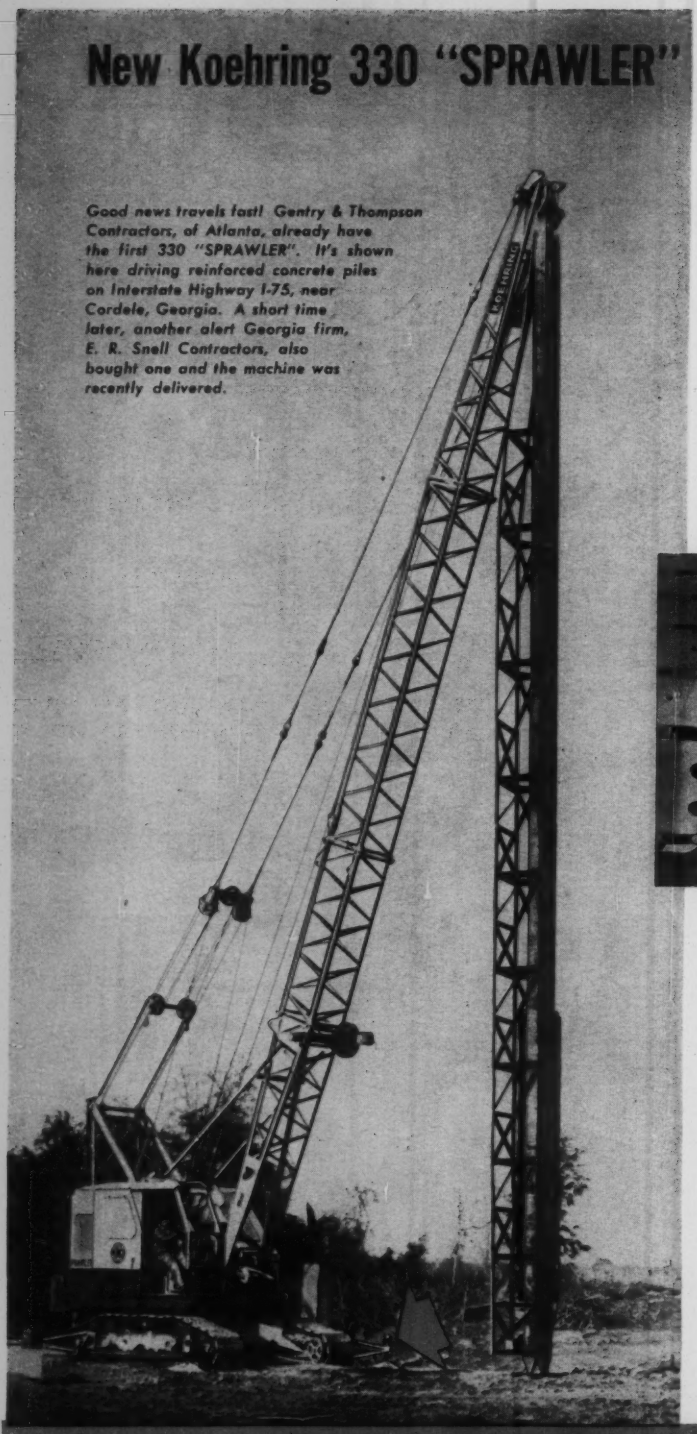
IGLOO
the world's No. 1 Water Cooler is available in 23 sizes and models—with one exactly for your job.

IGLOO
MEMPHIS 18, TENN.


CL-12 Drilling Machine
Tapping Sleeves and Valves
Inserting Valves
Fire Hydrants
Split Repair Sleeves
Valve Boxes
Gate Valves
Corporation Stops
B-100 Drilling, Tapping and Inserting Machine
Service Clamps
Service Pipe


it's MUELLER®
all along the line
Gain longer, more dependable service with reduced maintenance costs. Insure uniform product quality and reduced costs by utilizing one source of supply.
Specify the complete line of water works products—equipment backed by over a century of manufacturing experience and technical "know how".
Specify Mueller, all along the line.
MUELLER CO.
MUELLER CO. Since 1857 SEEKING BETTER WAYS QUALITY
DECATUR, ILL.
Factories at: Decatur, Chattanooga, Los Angeles; In Canada: Mueller, Limited, Sarnia, Ontario
Regulators
Lawn Faucets
Relief Valves
Stop and Drains
Meter Setting Equipment
Curb Boxes
Compression Stops
Curb Stops

New Koehring 330 "SPRAWLER"

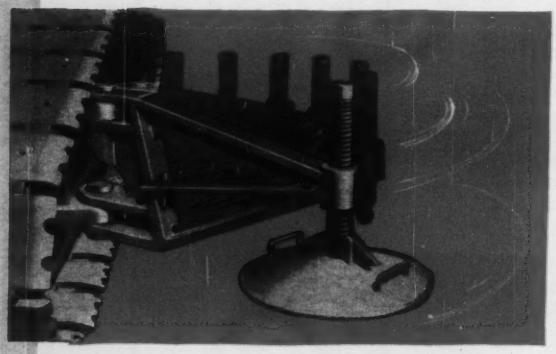


Good news travels fast! Gentry & Thompson Contractors, of Atlanta, already have the first 330 "SPRAWLER". It's shown here driving reinforced concrete piles on Interstate Highway I-75, near Cordele, Georgia. A short time later, another alert Georgia firm, E. R. Snell Contractors, also bought one and the machine was recently delivered.

outlifts its own weight by 11%

Max. lift capacity	**60,000 lbs.** (30' boom @ 12' radius)
Working weight	**54,000 lbs.***
Counterweight	power-removed (by A-frame)
Sprawling outriggers	pivot-mounted removable pedestals
Boom lengths	30 to 120 feet (pin-pad connected)
Jibs (on max. boom)	15 to 30 feet

*APPROX.



Pivoting outriggers swing out IN A MATTER OF MINUTES!

You're always ready to lift, *ready to go* with new Koehring® 330 "SPRAWLER" crane! Only takes a few minutes to sprawl the pivoting outriggers into position. Attach aluminum pedestals, and make your lift — up to 60,000 pounds! Want to lift and carry? Just raise the pedestals for ground clearance, and the 330 "walks" with 47,980-pound load. Or — remove the pedestals, swing outriggers against crawlers, and you're on your way! A phone call to Koehring distributor brings you the full story. Call or write today.

Yes, tell me more about 30-ton 330 "SPRAWLER" crane

☐ Also send specs. on larger 45-ton cap. 545 "SPRAWLER"

Mail to: **KOEHRING DIVISION, 3026 W. Concordia, Milwaukee 16, Wis.**

NAME _____ TITLE _____

COMPANY _____ DEPT. _____

STREET _____

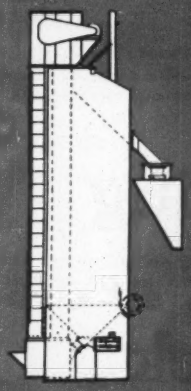
CITY _____ STATE _____

K32EM2

KOEHRING HEAVY DUTY

..keep your eye on KOEHRING WORK CAPACITY

THE JOHNSON "GOPHER" OPERATES AS A SINGLE REMOTE-CONTROLLED PLANT—OR AS THREE INDEPENDENT UNITS:

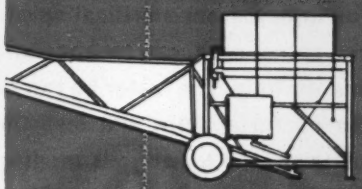


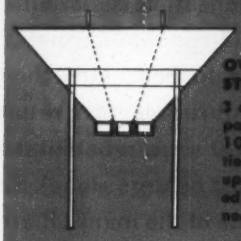
BULK CEMENT PLANT ON WHEELS

285-bbl. Porto-Silo, 8-ft. dia. with 180-bbl.-per-hour bucket elevator. (375-bbl., 9-ft. dia. silo also available.) 4,000-lb. cement batcher.

PORTABLE AGGREGATE BATCHER

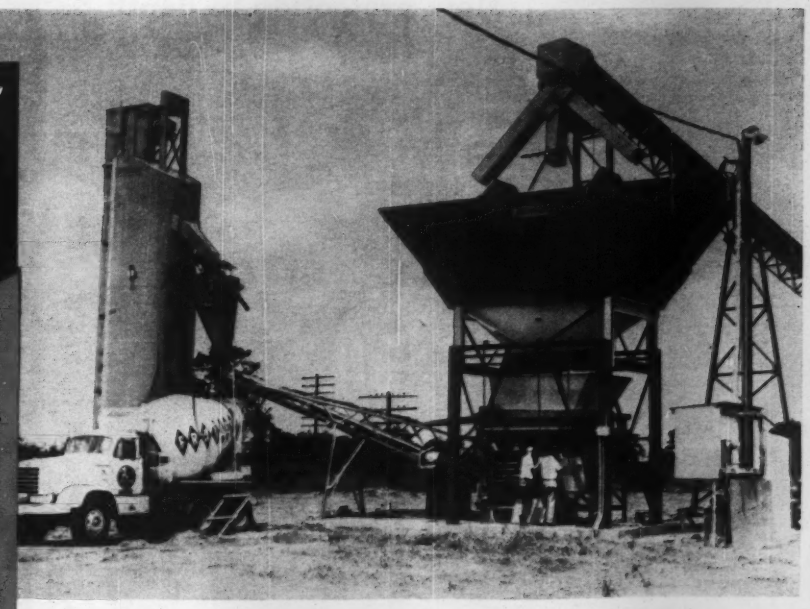
6 cu. yd. unit. Three 12,000-lb. weigh-beams. Electric control panel. Cable, plug-in connections to all motors. 24-in. belt conveyor.





OVERHEAD STORAGE BIN

3 aggregate compartments. 40 or 100-ton capacities. Quickly set up. No complicated structural work necessary.



60 to 70 cubic yards an hour

AT MINIMUM INVESTMENT IN PLANT EQUIPMENT

Here's your opportunity to cut aggregate and cement batching costs. On one-stop operation, the Johnson "Gopher" weighs out 60 to 70 cubic yards an hour — big output for only a minimum investment in batch plant equipment!

Pick-up-and-go portability

There's no complicated field assembly. All wiring, piping, air lines have pre-fit couplings and connections for quick, easy hook-up or disconnect. Any time you're ready to move to next job, just pick up and go! Complete wheel, axle, towing assemblies on cement silo and aggregate batch unit make moving easy. Quickly sets up anywhere. Flexible, too! Makes a complete one-stop batch plant — or operates as 3 separate units.

Everything pre-assembled

Big-capacity cement silo has self-contained bucket elevator system, boot hopper — and air-ram operated 4,000-lb. cement batcher, which can be remote-controlled from aggregate plant. Also in a single unit — aggregate batcher, discharge conveyor, auto-stop water meter with 2-in. piping. Independent overhead aggregate storage bin completes the "Gopher" plant. Everything you need in just 3 simple units — and at a low price that will surprise you! Better phone Johnson distributor, or write us today. You'll be glad you did!

JOHNSON

Mail to: C. S. JOHNSON COMPANY, Champaign, Illinois

Send "Gopher" ☐ spec. sheet ☐ bulletin ☐ Have distributor get in touch.

NAME _____ TITLE _____

COMPANY _____ DIV. _____

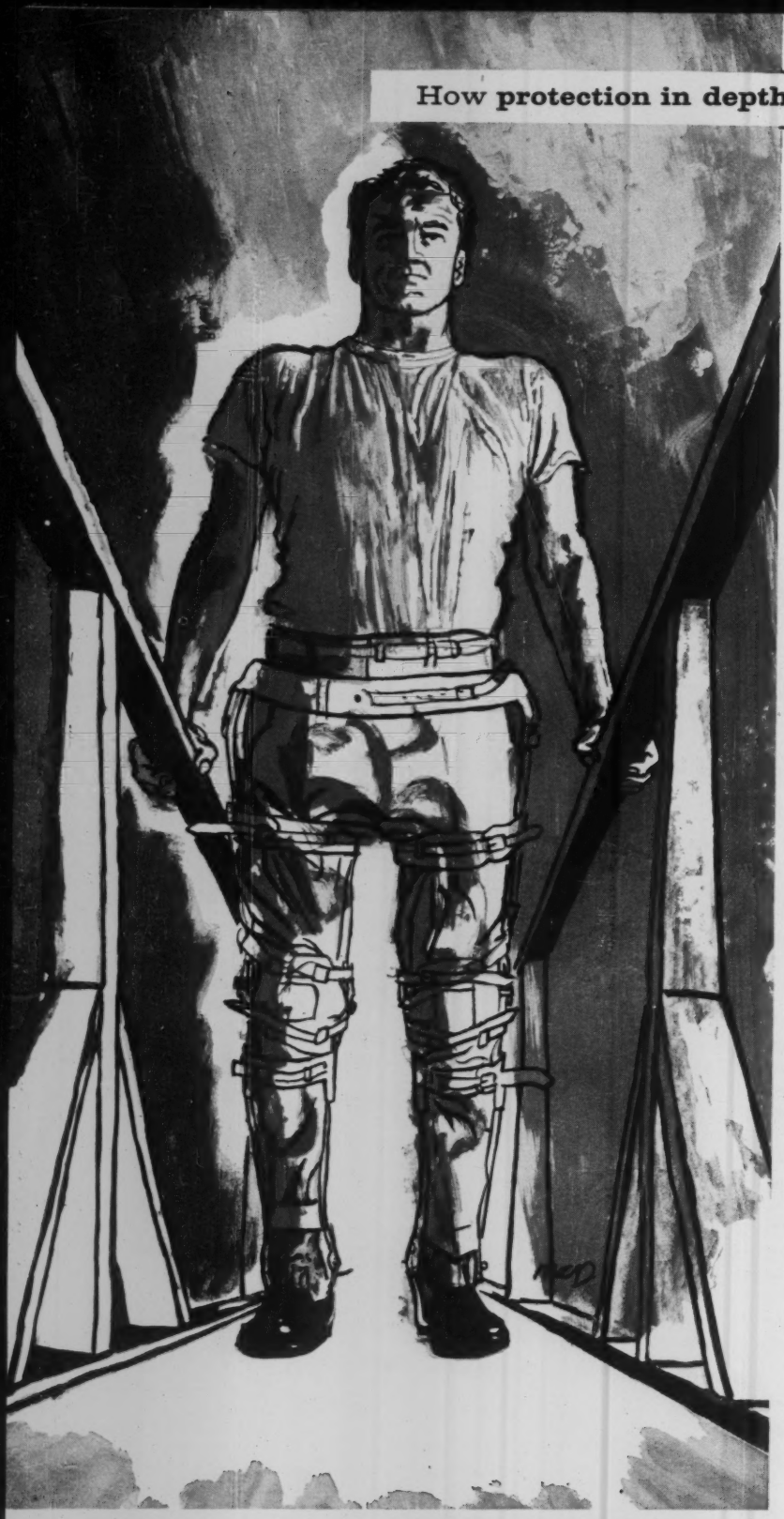
STREET _____

CITY, STATE _____ J4 ENR

"Keep Your Eye on the Gopher" FROM C. S. JOHNSON CO. CHAMPAIGN, ILLINOIS STOCKTON, CALIFORNIA

(Division of Koehring Company)

How **protection in depth** helps cut compensation costs



Shortening the long road back

Any serious injury, from a critical sprain to a severed spinal cord, can incapacitate a worker indefinitely. The faster he can be restored to useful activity, the less the human suffering, the lower your medical expenses and compensation costs. Since 1943, Liberty's world-renowned rehabilitation services have helped many thousands of seriously injured workers return to work (nearly 4,000 were rehabilitated at our two fully-staffed centers alone). Rehabilitation is but one of the many Liberty Mutual services that add up to protection in depth. To learn more about Liberty's protection in depth and how it can help lower your business insurance costs, contact your nearest Liberty Mutual office.

Look for more from **LIBERTY MUTUAL**

...the company that stands by you

LIBERTY MUTUAL INSURANCE COMPANY • LIBERTY MUTUAL FIRE INSURANCE COMPANY
HOME OFFICE: BOSTON

Business Insurance: Workmen's Compensation, Liability, Group Accident and Health, Fire, Fleet, Crime • Personal Insurance: Automobile, Fire, Inland Marine, Burglary, Homeowners

ENGINEERING NEWS-RECORD

Vol. 164, No. 19 May 12, 1960

Number copies printed this issue 86,204

CONTENTS

Highway Hearings End Round One..... 21
Stronger Structural Steel Coming Soon..... 24
Crane Sets Plywood Panels for Church Roof.... 26
Arizona Ahead in Colorado River Water Dispute 27
Ice Harbor Dam's Fishlift..... 27
System to Double Water Supply..... 27
Motor City's 9-Acre Showroom..... 28

FEATURES

San Jose Installs New Filtration Plant..... 32
Double Structure Is Bowl-in-Box Auditorium..... 38
More, Stronger Reinforced Concrete Pavements.. 44

INTERNATIONAL

To Dry Hong Kong Even 'Red' Water Is Gold... 49

FIELD AND OFFICE

New Resurfacing Mix Proves Out..... 50
Paver Has Internal Vibrators..... 55
Insulated Forms Aid Concreting..... 55

RESEARCH AND DEVELOPMENT

'Invisible Shield' Cuts Losses..... 57
Test Tractor Has No Gears..... 62

NEW PRODUCTS

Big Digger Available in U.S..... 69
Transistorized Pipe Detector..... 69
Rig Will Rip to 48 Inches..... 70
Sludge Collector Line Expanded..... 70

MEN AND JOBS

Miami's C. F. Wertz Keeps Water in the Black.. 75

BUSINESS AND FINANCE

Projects' Fates Rest With Court..... 111
Incinerator Pays Its Own Way..... 112
Machinery Orders Take a Dip..... 112

LABOR

Wages Are Still Going Up—No Slowdown..... 115
Engineers Vote IUE Tie-Up..... 118
Secondary Boycott Rejected..... 118
Most Road Pay to Equipment Men..... 118
Breakthrough on Bias..... 118

Reader Comment... 11
Washington Observer 19
Obituaries..... 83
Unit Prices..... 85
Materials Prices..... 89
Construction Reports. 91
Statistics, Indexes... 109
Editorials..... 132

Picture Credits

Cover—ENR; 21, 22, 23—Robert Phillips for ENR; 26—top, Piaget Studio; bottom, Hutchenson; 27—McGraw-Hill World News; 32, 33—ENR; 38—Ackroyd Photo Inc.; 39—top, Allan J. deLay; 44, 45—left, center, Don Gehring; right, Paul D. Steffe; 46—Oregon State Hwy. Dept.; 49—© South China Morning Post; 50—Paul Otis; 55—ENR; 57—Bureau of Reclamation; 75, 78—ENR; 111—top, Fay Foto Service; 112—P. P. L.

Back Issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semiannual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

A GREEN LIGHT FOR TWO-DAM PROJECT—The Federal Power Commission has licensed the Appalachian Power Company's two-dam Smith Mountain hydro project on the Roanoke River, downstream from Roanoke, Va. The company has already let the first construction contract.

BIG THINKING IN THE LITTLEST STATE—A $102-million redevelopment proposal for Providence, R. I., calls for construction of a civic center on 50 acres reclaimed by relocating the New Haven Railroad right-of-way. Private capital would finance most of the project. Other construction proposed for the center are a convention hall, office buildings, apartment buildings, a new railroad station, streets and freeways.

LETTING OUT THE SEAMS—Building sidewalk arcades inside buildings and then widening streets by tearing out existing sidewalks is one way New York City's garment center traffic congestion could be eased. The idea comes from Anthony J. Donargo, chief engineer in the office of the Manhattan Borough President. Estimated cost is $22 million. Mr. Donargo says the plan would make construction of the proposed $80-million Mid-Manhattan Elevated Expressway unnecessary.

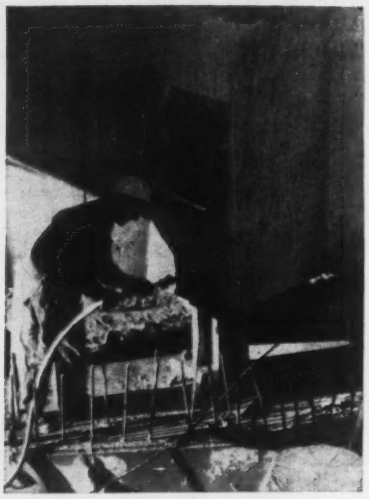
JET AGE SEWAGE DISPOSAL—Dulles International Airport probably won't discharge its sewage into the Potomac upstream from the District of Columbia water intake. Congress is expected to reverse itself and approve an Administration proposal that will keep Washington's tap water from becoming any more exotic. The plan calls for temporary disposal of treatment plant effluent by irrigation at the airport site. A $28-million interceptor will tie the Chantilly, Va., terminal into the D. C. system later.

FINE PRINT CLOGS A PIPELINE—Start of a $63-million section of a $338-million natural gas pipeline from California to Alberta, Canada, is stalled pending approval from the California Public Utilities Commission. A commission attorney wants approval held up until Pacific Gas & Electric Co. renegotiates with its Canadian suppliers. He says certain clauses leave California consumers open to increases in gas rates that the state couldn't control.

MADE IN JAPAN—Bidders on Mississippi's Biloxi Bay Bridge are stewing over a deal to use Japanese steel that low bidder J. B. Michael Co. of Memphis made with the State Highway Commission after the contract award. Michael will use Japanese strands in prestressed concrete spans on the $4.2-million job. The company convinced the state to accept a $15,000 saving on switch from U.S. materials that were the basis for all bids.

A new Ryerson service . . .

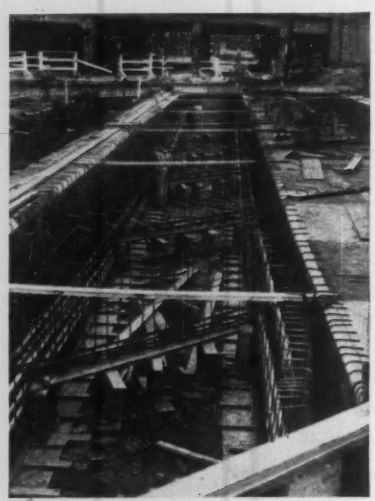
POST-TENSIONING FOR REINFORCED CONCRETE CONSTRUCTION



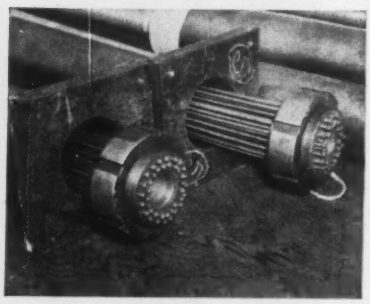
GROUTING MIXTURE is forced into tendons and around wires after stressing. Pressure injectors and venting procedures assure positive filling of all casing and trumpet voids.

The nation's most complete post-tensioning service is now being offered to contractors through the 20 Ryerson steel service centers coast to coast. This new service includes a complete "package": force development calculations, detailing and placement plans, complete tendon and anchorage assemblies, stressing and grouting equipment, and field labor procedures—assuring the most reliable cast-in-place or precast post-tensioned construction at minimum cost.

The patented* method for prestressing and anchoring reinforcements of concrete used by Ryerson is the time-proven BBRV system. The many advantages of this method have been demonstrated in hundreds of major European construction projects of all types over the past 15 years. Ryerson post-tensioning service also gives contractors the advantage of a single source for the fabricated re-bars, accessories and other steel requirements of the job.



SUPPLEMENTARY REINFORCING STEEL in position around tendons, and bridge girder.



40-WIRE ASSEMBLIES in flexible conduit before placement—showing moveable anchor head, lock nut, base plate, and trumpet encasing last few feet of flexible conduit.

SEVEN TENDONS (six 40-wire units and one 12-wire unit) draped in position for 156-foot bridge girder.

Examples of current projects using Ryerson post-tensioning service: the second deck approaches for the George Washington Bridge in New York City, Chicago's huge lake-front exposition hall, airfield pavement slabs at a California air base, a 468-foot overpass for the Northwest Expressway in Chicago (three 156-foot clear spans), the longest post-tensioned concrete bridge span in the Western Hemisphere at Oneida Lake, New York (total clear span, 320 feet).

For complete information on this new post-tensioning service or for help on specific projects, contact your nearby Ryerson plant. Specialists are available to give you all the facts, estimate costs, and show how Ryerson is equipped to improve and simplify your next construction job.

*U. S. Patent No. 2728978

RYERSON STEEL®

Joseph T. Ryerson & Son, Inc.

Member of the INLAND Steel Family

WASHINGTON OBSERVER

- **Congress serves up veto fodder**
- **Rapid transit for D.C. gets support**

- **Politics is becoming King in the dispute between President Eisenhower and the Democratic majority in Congress.** You can expect major actions from now until adjournment of Congress to be primarily based on Presidential campaign considerations.

Public works and construction become the shuttlecocks in the contest. Congressional Democrats are intent on presenting to the White House major legislation in public works and welfare; and the President is just as intent on blocking them by veto. Both sides acknowledge that the unsettled controversies will be taken to the voters in November elections.

The big issues:

Depressed areas legislation has cleared both houses and now faces an almost certain veto. The bill would provide $150 million worth of loans for construction of job-creating plants in distressed areas, $50 million in loans, and $35 million in grants for building public facilities.

Housing legislation is in for a Presidential veto as well. The House bill recently passed provides $1 billion to stimulate homebuilding. The Senate leadership is tempted to move for passage of the bill and let the President do as he will.

Some observers predict that even a school construction measure will go to the White House. The House has a $325-million-a-year construction aid proposal. Big stumbling block is the racial issue that may be too much of an obstacle to get by Southern opposition. But President Eisenhower would veto any such program.

Minimum wage is in controversy, too. The Democrats are pushing for a raise to $1.25 an hour; the President won't go beyond $1.15 an hour.

Democrats look forward to vetoes as political plums. In 1958 the President tried to thwart sewage treatment grants and new public works starts, and in November the Democratic majority was increased.

—

- **The White House proposal for bringing rapid transit to metropolitan Washington, D. C., is getting new support.** Local jurisdictions in Virginia and Maryland are swinging around to conditional approval. Officials told the Joint Congressional Committee on Metropolitan Problems they can go along with the first phase of a program—a temporary federal transit agency that would prepare plans and acquire right-of-way.

Local officials are still wary of a federal construction and operating corporation that would take over a $600-million project unless the District and the States establish their own compact.

The rapid transit system would be built to link northern Virginia, Montgomery and Prince Georges counties, Md., and the Capital.

FOR FIRM, DRY DIGGING ON YOUR WET JOB, PREDRAIN IT WITH A MORETRENCH WELLPOINT SYSTEM

Call us for a *realistic* estimate on your pumping requirements.

Moretrench Corporation

399 Main Street
Hackensack, N. J.
HUbbard 9-7676
New York Tel.: CO 7-2283

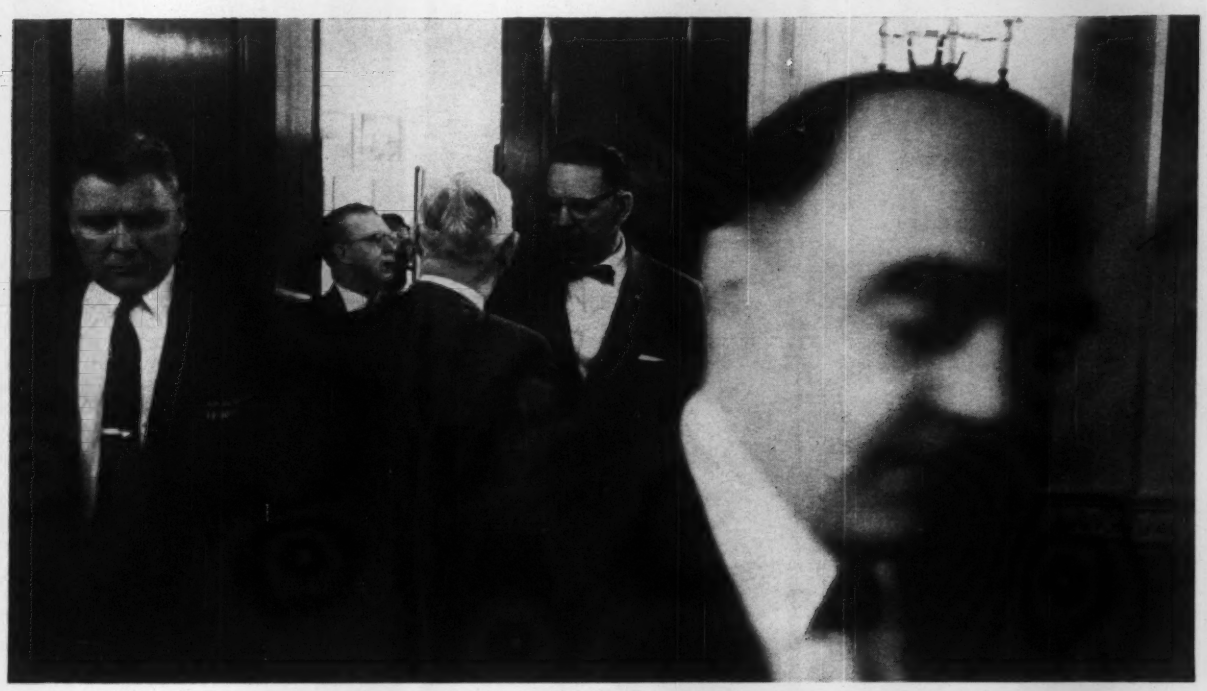
4900 S. Austin Ave.
Chicago 38, Illinois
POrtsmouth 7-4212

7701 Interbay Blvd.
Tampa 9, Florida
TAmpa 61-1881

315 W. 25th St.
Houston 8, Texas
UNderwood 4-7774

Rockaway
New Jersey
OAkwood 7-2100

WESTERN REPRESENTATIVE: Andrews Machinery of Washington, Inc., Seattle 4, Washington
CANADIAN REPRESENTATIVE: Geo. W. Crothers Limited, Toronto, Ontario
BRAZILIAN REPRESENTATIVE: Oscar Taves & Co., Ltd., Rio de Janeiro



Hard-punching investigators leave their mark on Interstate program as . . .

Highway Hearings End Round One

By Seth Payne

The special highway investigating committee headed by Rep. John A. Blatnik (D., Minn.) hauled one tiny piece of the 40,000-mile, multibillion-dollar federal-aid highway program up for public inspection last week.

Charges of graft and corruption in construction of federal-aid highways were dramatized with a witness testifying under police protection, a local political figure taking the Fifth Amendment, homespun testimony from a witness sworn in with his left hand raised, and state and national politics saturating the whole affair.

Unfortunately, the seriousness of the issue was often overshadowed by committee room dramatics. Election-minded legislators split sharply on party lines and devoted much of their efforts to harassing each other rather than digging to the bottom of the relatively small highway contract that was supposed to be the business at hand.

Under investigation by the legislative committee are allegations of graft and corruption in building some 13.8 miles of federal-aid highways in Tulsa, Okla. Because of the combination of Interstate roadway and urban mileage, the cost of the roadwork under investigation amounted to $8.6 million of which the federal government paid some $5.8 million.

Although it was completed only about a year ago, the four-lane asphalt highway—connecting the Will Rogers and Turner turnpikes around Tulsa—is said to be showing obvious signs of substantial deterioriation. The congressional committee set out to prove that the road was constructed under some highly questionable building practices.

Last week's hearings may or may not be the last highway investigation before Congress goes home this summer. But in any case, the Blatnik committee—and its top-notch staff of investigators and prosecutors—already have scored.

Primarily, they want to prove that the billions of federal funds to be poured into highway building over the next decade require a continuing independent committee riding herd on the state and federal spenders. What they have put on the record so far, they feel, justifies Congress voting them ample funds to continue the same kind of investigations and hearings next year.

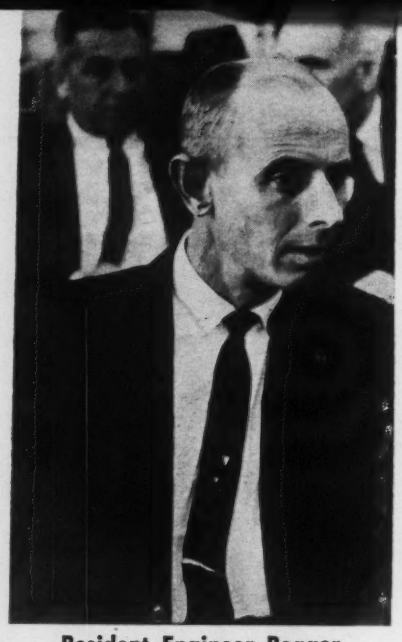
If by any chance the Oklahoma hearing runs its course, Representative Blatnik's staff has on hand other cases they are ready to put before the committee—involving, they indicate, equally sensational charges on the handling of funds in other states.

Committee Counsel Walter May methodically called in a dozen or so witnesses to prove that:

- The roadway was not built to federal specifications.
- The state and Bureau of Public Roads were derelict in administering the project.
- Test reports on construction of the highway were falsified time after time.
- The state paid for materials that never went into the roadway.
- A state highway commissioner was a silent partner in a roadway contracting

***Seth Payne** of ENR's Washington staff reports the long-awaited highway hearings. Republican Congressmen on the committee came to last week's hearing armed with copies of ENR's April 28 issue, in which Payne predicted what the Democratically controlled committee would try to prove.*

Politics prevailed—Republican Schwengel vs. Democrat Blatnik.



Resident Engineer Reager
. . . accused of ordering false reports.

firm to which he had awarded contracts.

The first witness was Ralph C. Glover, district engineer of the Oklahoma division of the Bureau of Public Roads, an employee of the bureau since 1934. During the time the controversial Tulsa highway projects were under construction, Mr. Glover served as area engineer for BPR and was responsible for inspecting the roadwork for the bureau.

To show that the Bureau didn't provide adequate inspection of the projects, committee counsel May asked: "Mr. Glover, during the construction of these projects, what sort of inspection did you make? What would you normally do?"

Glover: "I inspected the work that was under way at any time that I was visiting the project. I covered every phase of it. I talked with the resident engineer (Mr. Henry Reager, at that time employed by the Oklahoma State Highway Department) in regard to his problems in connection with the work. I looked over the records of the resident engineer which pertained to the project."

May: "To what extent did you rely on the resident engineer?"

Glover: "Well, I had to rely on him rather completely."

May: "During the course of the inspection did you yourself make any physical checks or tests?"

Glover: "No."

Digging deeper into the Bureau's acceptance of the resident engineer's reports on their face value, Counsel May asked: "Did you not ever go behind those reports to determine exactly what was happening?"

Glover: "No."

May: "Does the Bureau of Public Roads expect you to go behind those reports?"

Glover: "No."

The counsel then established that both the Oklahoma State Highway Department and the Bureau of Public Roads had officially accepted the highway projects.

Pressing the point, Mr. May asked Mr. Glover: "The projects were accepted by the Bureau of Public Roads as being satisfactory. Is that true?"

Glover: "Yes, that is true. We stated, or I stated they are completed in substantial conformity of the plans."

May: "Also you have there a certification on each project by the state that appropriate samples of the materials have been tested and found to be in accordance with specifications. Is that true?"

Glover: "There is a paragraph in each of these reports that refers to the state's certificate of materials, which does certify that the materials have been tested and meet the specifications."

Having established that the work had been accepted without qualification by the state and federal government, the committee counsel then turned to a report made Jan. 11, 1960, by Mr. Glover relative to a re-inspection of the highways after they had come under attack locally.

Reading from Mr. Glover's report titled "Office Review Based on Records

Engineer's Aide Johnson
. . . admits carrying out the orders.

'Sod Boy' Downey
. . . repented, decided to tell truth.

Ex-Commissioner Kight
. . . silent about silent partnership.

and Personal Knowledge," Mr. May quoted:

"Reason for the report. As a result of a clipping from the Tulsa Tribune, Nov. 1959, on alleged deficiencies in construction and inspection practices of the Department of Highways on these projects, in which it was inferred that there was also a laxity in the inspections made under the direction of the Oklahoma office of the Bureau of Public Roads, this report is written." Continuing, Mr. May quoted from the report, "The inspections were all made with the state's resident engineer or his authorized representative. . . . The work under way was inspected in detail with particular attention to construction methods, materials used, tests being made and adequacy of inspections and control."

Mr. May then asked: "Mr. Glover, what did you mean by saying that the work was inspected in detail?"

Glover: "I meant by that that I inspected the work that was under way at the time of each inspection."

May: "You say density tests made by state personnel were checked in detail. By whom and how was this done, Mr. Glover?"

Glover: "I checked them or looked them over. I looked over the state's reports and reviewed the information that was contained in them."

May: "I will read just the last two paragraphs of the report. 'General Comments and Conclusions.' In view of the vigor and perseverence of the procedures that were habitually followed on these projects, it cannot be truthfully said that Bureau of Public Roads was deficient or lax in performing inspection duties. . . ."

With this atmosphere, the counsel hammered at Mr. Glover as to why he was content to accept the state reports without making his own tests. Mr. Glover replied that the Bureau of Public Roads procedure was based on the integrity of state officials. "In the state-Bureau of Public Roads relationship," he told the legislators, "when the state said it had conducted tests, we believed them."

"But," countered Mr. May, "after criticism indicated some malpractices had occurred, did you still believe them?"

"We had no direct information that anything was wrong," Mr. Glover said.

Rep. Fred Schwengel (R., Iowa) came to Mr. Glover's defense. "Had you or anybody in the Bureau of Public Roads any reason to question the honesty or integrity of the Oklahoma officials?"

"No," Mr. Glover told the congressional committee. "We have had about 40 years experience with the states and have confidence in their reports."

Congressman Schwengel followed up on his point: "But later you found one official had misled you?"

From the Democratic side of the committee came a quick comment from Rep. John C. Kluczynski of Illinois, that "the Bureau of Public Roads would never have found anything wrong."

Rep. John F. Baldwin, Jr. (R.-Calif.) picked up the questioning and asked Mr. Glover: "Did you proceed on this project the same as on other projects?"

"Yes," Mr. Glover replied.

Rep. James Wright (D., Tex.) came in from the Democratic side of the committee and questioned Mr. Glover: "Is this procedure the same as followed throughout by the Bureau of Public Roads?"

Mr. Glover asked that the question be deferred for other Bureau witnesses that were in a position to comment on policy matters.

Contractor Layman
. . . took the Fifth Amendment.

Roy E. Biffle, now resident engineer for Tulsa County for the Oklahoma State Highway Department, was called to testify. He was assistant to Henry Reager, resident engineer at the time of the controversial highway project.

Counsel May asked Mr. Biffle: "Did you notice that some subbase on the road was improperly constructed?"

(*Turn the page*)

Mr. Biffle admitted, "I would say there were places in it that were loose and soft." And in other cases, he testified, the subbase material did not have the resistance to water it should have had.

Mr. Biffle then testified that he had called this to the attention of his boss, Mr. Reager, the resident engineer, and been told, in effect, to mind his own business. Mr. Biffle told the legislative committee that Mr. Reager had transferred other men off jobs if they didn't cooperate with him.

Albert I. Moore, a state highway department bookkeeper, testified to certain irregularities in bookkeeping that occurred on the project. The committee brought on two of its staff members, James Fitzpatrick and Robert McElligot, to produce evidence of double billing for materials, overbilling on materials, and other irregularities. Working with only part of the records, the committee was told of approximately $45,000 in apparent false charges to the state.

Joe R. Johnson, instrument man and engineer's aide on the project, told the committee that he had been instructed by resident engineer Henry Reager to make up false density samples to send to the state laboratory at Oklahoma City. Mr. Johnson related that a chart was kept in the resident engineer's office so that phony samples could be given a label to indicate they had come from the roadway. When tests were made from the roadway and failed to come up to specifications, Mr. Johnson told the committee they were always doctored so that they would pass the Oklahoma City tests.

James F. Avery, materials man for the state highway department on the project, told how he had instructed some of the men working under him to make up false samples. Mr. Avery testified that at one time he took samples made by the contractor, put them in state bags with project labels, and sent them to Oklahoma City as though they had been taken from the job site.

Hubert M. Knoop, engineer's aide for the state on the project, told how density tests taken on the project showed only about 4 in. of subbase where the specifications called for 8 in.

Lee Olen Downey, a former partner in the D&G Construction Co. with a sodding contract, came before the committee under Oklahoma state police protection. He told how the D&G sodding contracting firm was formed with Oklahoma State Highway Commissioner H. Tom Kight as a silent partner.

Mr. Downey told the committee that earlier this year he appeared before a Tulsa County grand jury and lied about the make-up of the D&G Construction Co. Then, he said that in spite of veiled threats on his life, he repented and decided to tell the truth about his company.

The committee produced bank records to show that thousands of dollars had been drawn as profits from the company with Mr. Downey receiving half of the money. Mr. Downey then testified that he had repeatedly paid H. Tom Kight his share of the profits in cash payoffs made on the back porch of Mr. Kight's home.

Under questioning by Counsel May, Mr. Downey was asked, "Did you meet with a number of other sodding contractors before contracts were let?"

Mr. Downey replied, "Yes, us sod boys would get together to try to hold the price up so it wouldn't get too low." Mr. Downey said when the group met they would decide who would get the next contract. Then, two or three other contractors would bid on the job, but make sure they were higher than the one slated to receive the contract.

The committee called Mr. Kight, no longer a state highway commissioner, who exercised his privilege to take the Fifth Amendment and not answer questions.

Mr. Kight told the legislators, "In view of the fact that I have been charged in two criminal investigations in Tulsa City, I desire to claim my constitutional right and not answer questions."

A similar plea was made by Andrew H. Layman, Jr., partner in the firm of Layman and Sons that held the prime contract on the roadbuilding job.

The last witness on Friday afternoon

Stronger Structural

AISC conference learns details of A7 replacement —also of new developments in high-strength bolts and results of destructive tests on full-size truss

Approval of a specification for a stronger, weldable structural steel that may be used instead of ordinary structural steel can be expected by midsummer. That's what engineers attending the Twelfth National Engineering Conference of the American Institute of Steel Construction in Denver were told last week.

They also learned that a new specification for joints with high-strength bolts, permitting higher design stresses, had been approved by the Research Council on Riveted and Bolted Structural Joints, the AISC, and the Industrial Fasteners Institute. And the conference received a report summarizing results to date of destructive tests on a full-size truss bridge at Northwestern University, Evanston, Ill.

The specification for the new structural steel sets the minimum yield point at 36,000 psi, 10% higher than that for A7 steel. Controlled chemistry will permit its use where weldability is required, instead of A373 steel, in most cases (ENR Apr. 28, p. 17).

An American Society for Testing Materials subcommittee on structural steel has endorsed the specification unanimously, reported T. R. Higgins, AISC director of engineering and research.

If Committee A-1 on Steel approves the specification at the ASTM annual meeting in Atlantic City, N. J., next month, the only remaining step is the

How the New Steel—A36—Compares With A7 and A373

	A36	A7	A373
Tensile Strength, psi: For shapes of all thicknesses	60,000 to 80,000	60,000 to 75,000	58,000 to 75,000
For plates and bars Up to 1½ in., incl. in thickness	60,000 to 80,000	60,000 to 72,000	58,000 to 75,000
For plates and bars over 1½ in., in thickness	60,000 to 80,000	60,000 to 75,000	58,000 to 75,000
Yield Point, min, psi.	36,000	33,000	32,000
Elongation in 8 in., min, percent	20	21	21
Elongation in 2 in., min, percent	23	24	24

was Federal Highway Administrator Bertram D. Tallamy, who told of orders he had sent out the week before the hearing calling for checks on performance of contracts that the Bureau has never before required.

He also stated that the federal government is taking action to get back money paid out on construction found to be below specification.

Mr. Tallamy told the Oklahoma State Highway Commission: "Restitution will be made by reimbursement from the state or by withholding appropriate amounts of federal funds which otherwise would be paid to the State of Oklahoma on account of other federal-aid projects."

BPR also directed the commission to keep out of all federal-aid projects those employees who admitted wrongdoing on the controversial four-lane asphalt highway. Vouchers won't be approved for payment of federal funds for materials or work on any project these men are connected with.

Mr. Tallamy told the committee that he is checking the Bureau's Project Examination Division to see if it needs revamping.

Other witnesses came before the congressional body to defend or refute testimony as it had been given. There was little doubt, however, when the gavel rang down on the hearings but what the legislative committee had made its point: That the big federal-aid highway program can stand the type of scrutiny that the committee wants to give it.

Steel Coming Soon

formality of its certification by the ASTM Committee on Administrative Standards—in about 30 days.

The specification has been given the designation A36—Specification for Structural Steel.

John R. LeCron, metallurgical engineer, Bethlehem Steel Co., revealed the chemistry and physical properties that will be required of the new steel. He also compared these with those of A7 and A373 steel. (See table on p. 24.)

A36 steel, like A373, he pointed out, is limited to material not more than 4 in. thick; whereas A7 is not limited in thickness.

To achieve unanimity in subcommittee balloting, a statement similar to the one in A373, that the steel is recommended for welding, has been omitted. But the recommendation is certain to be up for consideration again soon.

The new specification sets a limit on maximum carbon content of 0.28% for all products in all thicknesses. A7 has no maximums for carbon, manganese or silicon.

Manganese and silicon requirements of A36 and A373 are close, especially for bars and shapes. For plates thicker than ¾ in., A36 permits more carbon and manganese (to obtain the higher yield point) than does A373. Hence, for bars and shapes, and for plates up to ¾ in. thick, which are estimated to include about 90% of welded construction, A36 is equivalent to A373 in weldability.

The new specification for bolted structural joints replaces one in use since 1954. As analyzed by Edward R. Estes, Jr., AISC research engineer, one of the most important provisions of the new specification is recognition of the difference in strength of friction-type and bearing-type connections.

For friction connections, useful when slippage is undesirable or fatigue failure is possible, the allowable stress for high-strength bolts (ASTM A325) remains at 15,000 psi on the nominal cross section. But for bearing connections, when the threads are outside the bearing area, a higher working stress is permitted. When 20,000 psi is permitted on the net section in tension, 22,000 psi is allowed on the nominal cross section of the bolt in shear. When threads are present, stress is limited to 15,000 psi.

The new specification also sets an allowable stress for A325 bolts in tension at 45,000 psi on the nominal area. It also allows use of three styles of bolts and two styles of nuts. Thus, the same size bolt head and nut can be used, permitting ironworkers to use only one size of wrench or socket for a specific bolt assembly. And heavy semifinished hexagonal bolt heads and nuts are permitted, eliminating the need for washers.

Results to date with the Truss Bridge Research Project at Northwestern University were outlined by John F. Ely, acting director of the project. The test bridge is a half-linear-scale model of a 200-ft, 8-panel, Warren double-track railway span (ENR Jan. 30, 1958, p. 53). It is constructed to permit rearrangement and replacement of parts. Members are made of medium manganese steel, except for those to be tested to destruction.

Tentative conclusions reached so far:

- Forces computed on the assumption of simple-truss action are close to those found experimentally.
- Measured stresses in lower chords and diagonals are lower than those computed, because the floor system acts as part of the lower chord.
- The facility is capable of checking new design concepts and verifying new theories not only in the elastic range, but right up to ultimate loads.

New York State Okays Private Sewage Systems

Private corporations can now build and operate community sewage systems under a new law enacted in New York State.

The act frees homebuilders from a restriction they have sometimes found irksome. Housing developments to be served by community sewage systems have had to be located where public agencies were ready and willing to take on the responsibility of operating and maintaining the sewage system. Now a private corporation can be set up to assume the responsibility.

The New York State Home Builders Association sponsored the new law.

Certain other states, Florida and Texas, for example, also permit privately owned sewerage systems.

The Federal Housing Administration's underwriting practices permit consideration of privately owned sewerage systems. However, publicly owned systems are preferred. Under FHA practice, private systems are preferably controlled by a state public utility commission or similar state body.

Industrial Waste Control Law May Become Stiffer

The New York City Council is considering a bill that would put teeth into existing laws banning the discharge of toxic chemical wastes into the city's sewers. Violators would be subject to fines and jail sentences.

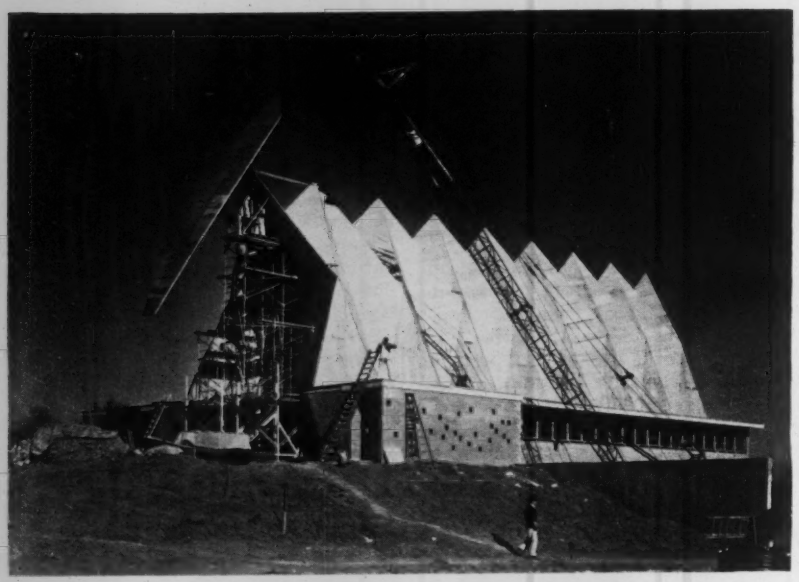
The proposed law, now in committee, along with enforcing the ban on toxic wastes, would levy surcharges, over and above normal sewer rental, against industries that dumped into city sewers any waste that is apt to clog or damage the city's sewage disposal system.

Last summer, operations at the $50-million Bowery Bay plant were severely impaired when metallic wastes destroyed the bacteriological action of the high-rate activated sludge process (ENR July 2, 1959, p. 17).

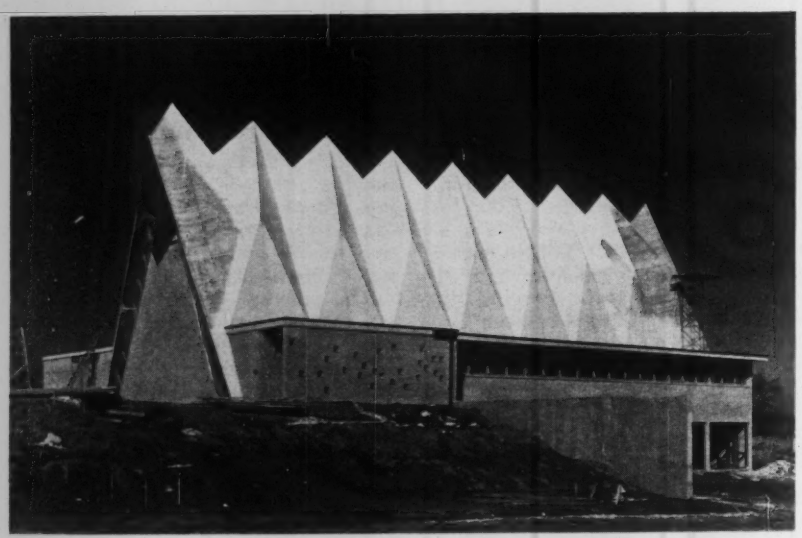
Faulty Wiring Blamed In Recent School Fire

Philadelphia fire officials now blame faulty wiring for the March 10 fire at Overbrook School for the Blind (ENR Mar. 17, p. 26). They had at first suspected a neglected cigarette as cause of the half-million dollar blaze in which one fireman was killed and six others injured (ENR Mar. 17, p. 26).

Fire Marshall Wilmer Boardman says the fire probably began in a loft under the Spanish tile roof of the three-story main building. The fire may have been raging in the loft for some time before it burned through woodlath and plaster and spread to the room below, he said.



Crane Sets Plywood Panels for...



...Church With a Pleated Roof

Plywood stressed skin panels form the accordion-like roof of this Independent Congregational Church in St. Louis. The structure is self-supporting without an independent frame system.

Each of the eight-sided, peaked sections stands 35 ft high and spans 32 ft at floor level; total length of the nine sections is 110 ft. Individual panels—weighing 5 psf—are ⅜-in. plywood on 2x4 and 2x8 in. framing.

Steel strips form the joints between panels. Individual strips are cut to length and bent to match the angle of each panel intersection. Applied on the interior side of the panels with lag screws; the steel joints are concealed behind the interior finish sheathing.

The ceiling is finished with ½-in. by 8-in. ceiling boards. The roof exterior is painted.

Most of the roof was erected from a movable wooden scaffold. Steel scaffolding was needed only for the balcony framing.

The entire project cost $280,000. The roof contract—structural work and ceiling in place—cost $25,000.

Roof Structures, Inc., Webster Groves, Mo. designed the roof. The architect for the building was Manske & Dieckmann, St. Louis. A. H. Haeseler, St. Louis, was general contractor.

Jinxed Floating Bridge Under Construction Again

The Washington Toll Bridge Authority has resumed work on the last two pontoons of the storm-tossed Hood Canal floating bridge and will begin modifying the 21 completed pontoons late this month (ENR Feb. 18, p. 30).

The principal design change will be the installation of 24 steel tendons the length of each of the 360-ft pontoons and through the joints between them.

Each tendon will consist of 40 ¼-in., high-strength, post-tensioned steel cables. Half the tendons will go just below the deck and the other 12 will go just above the bottom slab. The builders will fasten the tendons to concrete anchors about 15 ft on either side of each joint.

Howard, Needles, Tammen & Bergendoff, Kansas City consultants brought in to complete the design and put the bridge together, recommended the changes (ENR Mar. 17, p. 17).

Repairs to the $17-million bridge will cost about $7 million, according to an unofficial estimate. Completion was originally scheduled for May 18. Gov. Albert Rosellini, for whose administration this project has been an extremely hot potato, says that it will be completed in from 30 to 90 days. The consultants say they can't make any estimate on how long it will take or how much it will cost.

Second Floating Bridge For Lake Washington OK'd

The Washington Toll Bridge Authority, which has had hard luck with its Hood Canal floating bridge since December 1958, (see above) has overcome legal obstacles that stood in the way of construction of a second floating bridge across Lake Washington.

More than a year ago Guy F. Atkinson Co., San Francisco, submitted a low bid of $10,969,597 for construction of a floating section of the bridge. But a lawsuit challenging the legality of the financing plan for the span made a contract award impossible (ENR May 7, 1959, p. 99). Atkinson has signed several extensions of its bid offer.

The State Supreme Court has approved a financing plan. The authority then negotiated another 60-day extension and ordered preparation of a call for bids on the sale of a $30-million revenue bond issue.

Under the financing plan King County agreed to establish a $700,000 annual revolving guarantee for a period of at least 13 years to supplement any insufficiency in toll revenues. Lake Washington is entirely within King County. The proposed bridge will be three miles north of a floating bridge built in 1940.

Colorado Diversion

Special trial master favors Arizona claims; California completes aqueduct

Arizona has won a major preliminary victory over California in the long dispute over Colorado River water rights. Recommendations tentatively to be made to the U. S. Supreme Court by Special Trial Master Simon H. Rifkind would reject California's claim for 5,360,000 acre-ft a year and limit the state to 4.4 million acre-ft, the quantity allotted to it by Congress in Hoover (then Boulder) Dam legislation in 1929. Arizona would get 2.8 million acre-ft from the main stem Colorado plus one million more from the Gila River, a Colorado tributary.

Although a blow to California, the setback is already strengthening support for the proposed $1.75-billion bond issue to finance works to take northern California water to the dry southern section.

For Arizona, the recommendations look like a big step toward realization of the Central Arizona Project. Long postponed for lack of a dependable water source, this scheme involves diversion of Colorado River water to the Phoenix area for irrigation.

Interested parties have a month to comment on the recommendations before Judge Rifkind submits the report to the Supreme Court. Thereafter, objections and arguments can be made to the court itself before a final decision is rendered.

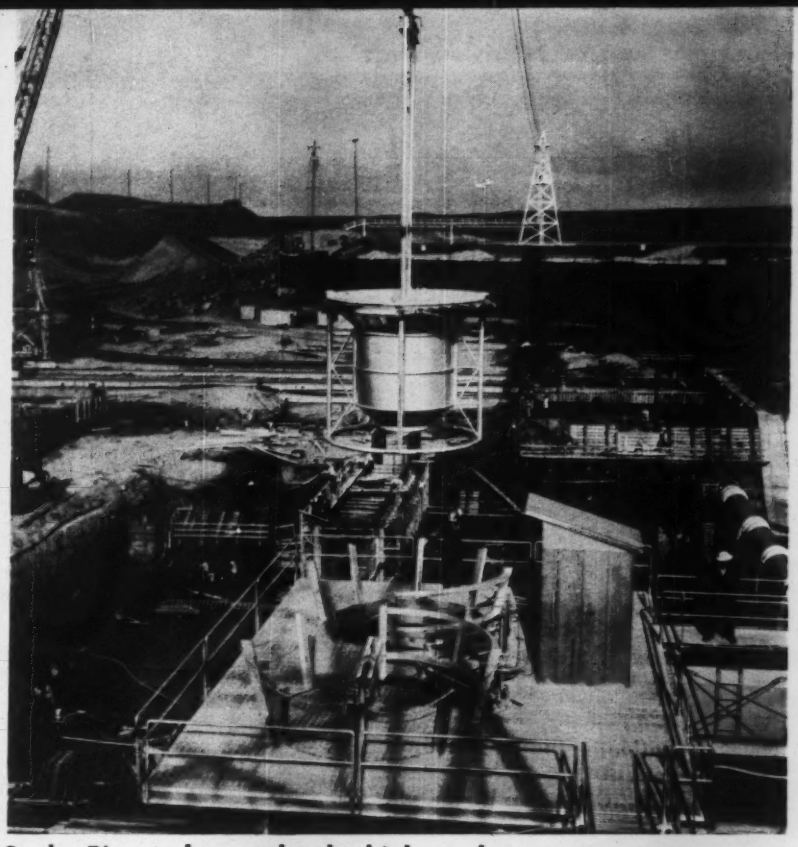
• **California completes its aqueduct**—Meanwhile, an earlier focus of Colorado River rivalry passed a milestone last week. Ceremonies marked completion of the Colorado River Aqueduct, a project that once irked Arizona to the point of calling out the National Guard.

The $200-million expansion, begun in 1952, brings the aqueduct capacity up to the level planned for it in 1932 when construction was started.

The increased capacity is expected to accommodate the 87 municipalities served Colorado River water until 1975 when the population of the 3,300-mile one-time desert is expected to swell to 10 million.

The main-line aqueduct runs from Parker Dam, a control structure 150 miles down the Colorado from Hoover Dam, over rugged mountainous terrain to Lake Mathews, a reservoir west of Los Angeles.

Important features of the expansion are enlargement of all five pumping stations, installation of 30 pumps and construction of 107 miles of pipeline (ENR Jan. 9, 1958, p. 36).



Snake River salmon take the high road upstream on . . .

Ice Harbor Dam's Fishlift

Migrating salmon at Ice Harbor Dam site are jumping the cofferdam with an assist from the Corps of Engineers' latest fish-lifting technique.

Since the Snake River is completely blocked to the chinook headed upstream, the Corps has a large-scale "bucket brigade" operating 24 hours a day to move the fish upstream, beyond the damsite.

A system of buckets, running on a cableway between two 130-ft-high towers, transports the chinook from gathering pens within the northshore cofferdam to slack water where they continue their migration.

The fish, on entering the downstream fishway, jump a weir and trap themselves in a collecting chamber where they enter the buckets.

The fish-in-the-bucket then get hoisted 80 ft and trolleyed upstream where they are released.

Spawning salmon will use the $500,000 aerial transfer for the next two seasons after which permanent fish passage facilities will go into operation and the bucket line will be dismantled.

System to Double Water Supply

A $53.5-million contract was awarded to Atoka Water Contractors Co. for construction of a water distribution system for Oklahoma City (ENR May 28, 1959, p. 30).

The contract was awarded by the Oklahoma City Development Trust, a body created to control the city's water system and now undergoing constitutionality tests in the courts.

The over-all program is aimed at doubling the city's water supply. Major phases of the improvement would include:

• A 48-in. concrete pipeline, nearly 100 miles long, to convey raw water from the recently completed Atoka Reservoir to a terminal reservoir outside the city.

• An earthfill dam to create the 100,000-acre-ft terminal reservoir at Oklahoma City.

• A 30 mgd treatment plant near the terminal reservoir.

• Six pumping stations with an initial capacity of 45-mgd and a 500,000 gallon storage tank.

Atoka Water Contractors is a joint venture of Tecon Corp., Dallas, Gill Construction Co. and Metropolitan Paving Co., both of Oklahoma City, and Standard Industries, Inc., Tulsa.

Detroit's bid for big convention business nears completion. It's the . . .

Motor City's 9-Acre Showroom

Construction of Cobo Hall—one of the largest exhibition buildings in the world—will be finished ahead of schedule. Detroit will dedicate the fair and convention complex at the opening of the National Automobile Show on October 15. The circular convention arena at the southeast corner of the main building will be completed early next year.

Covering 17 acres of land on Detroit's riverfront, Cobo Hall—named after Detroit's late Mayor Albert Cobo—provides 400,000 sq ft of exhibition space as well as meeting halls, dining rooms, and the convention arena. Roof top and basement parking areas will handle 2,600 cars. All together this totals more than 2.2 million sq ft useable floor space.

Foundations for the exhibition hall and arena are cast-in-place piles—4,400 of them—extending about 95 ft through clay to a hardpan stratum just above bedrock (ENR Aug. 28, 1958, p. 28).

The $54-million project straddles the six-lane John Lodge Expressway for a distance of 850 ft. And above the tunnel section, three of the four "halls" of the exhibition building can be combined into a single area measuring 405 by 715 ft. Only 10 columns break up the space; they run in two rows of five columns on a 120 by 240-ft bay spacing.

Bridging the expressway while also creating large clear areas inside the building called for some sizable steel trusses. In all, over 70 trusses ranging from 32 to 109 tons are included in the framing.

When it is completed the circular convention arena—315 ft across and 100 ft high—will provide a total seating capacity of 12,500 including 9,500 permanent seats. A removable stage plus refrigeration equipment in the main floor will allow for a variety of sports events in addition to convention meetings.

The exhibition and convention hall forms a major part of the Detroit Civic Center, which extends along the Detroit River, and includes also a civic auditorium.

Giffels & Rossetti, Inc., is the architect and engineer for the project. Darin & Armstrong, Inc., was the foundation contractor; O. W. Burke Co. held the superstructure contract. R. C. Hahon Co. was the steel subcontractor. All are Detroit firms.

Pittsburgh-Des Moines

the

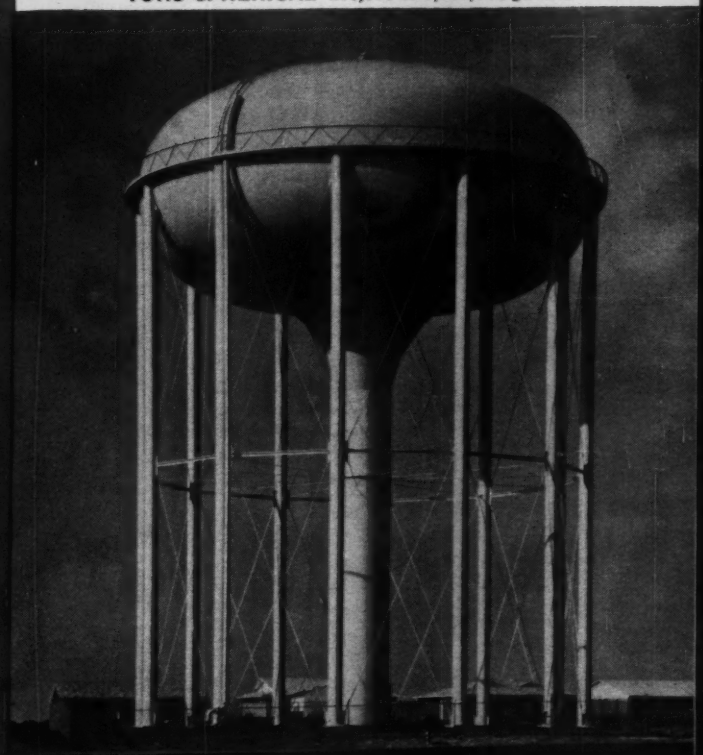
TOP NAME

for QUALITY in

ELEVATED

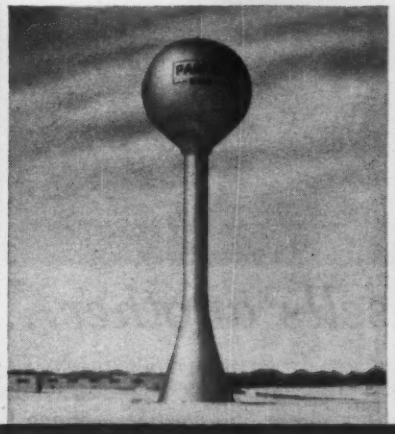
STEEL TANKS

TORO-SPHERICAL 200,000 to 3,000,000 gallons



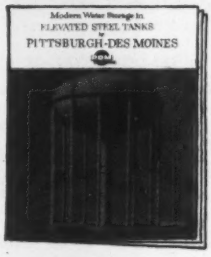
PEDESTAL SPHEROID
200,000 to 750,000 gallons

PEDESTAL SPHERE
25,000 to 300,000 gallons



WATERBALL
10,000 to 100,000 gallons

PDM
ELEVATED STEEL TANKS



SEND FOR NEW 20-PAGE CATALOG—FREE ON REQUEST

You can depend on PDM . . . for the *complete range* of modern elevated tank types and capacities to serve each water storage need . . . and the *quality of construction* that protects your community's investment over the greatest number of years of faultless service. • Almost sixty years of PDM experience in building steel elevated tanks is at your disposal. Write us!

Pittsburgh-Des Moines Steel Company

Plants at PITTSBURGH, WARREN, BRISTOL, PA. • BALTIMORE • BIRMINGHAM • DES MOINES
PROVO, UTAH • CASPER, WYO. • SANTA CLARA, FRESNO, STOCKTON, CALIF.

Sales Offices:

PITTSBURGH (25).....3414 Neville Island
BALTIMORE (26).....Curtis Bay Station
NEW YORK (17).....Suite 2716, 200 E. 42d St.
NEWARK (2).....744 Broad St.
CHICAGO (3).....618 First National Bank Bldg.
ATLANTA (5).....361 E. Paces Ferry Rd., N.E.
JACKSONVILLE (7).....4066 Ferrarra Road
DES MOINES (8).....915 Tuttle Street
DENVER (2).....323 Railway Exchange Bldg.
DALLAS (1).....Suite 1719, Southland Center
SEATTLE (1).....Suite 322, 500 Wall St.
SANTA CLARA, CALIF.....621 Alviso Road
EL MONTE, CALIF.....P.O. Box 2012
FRESNO, CALIF.....346 "G" St.
STOCKTON, CALIF.....348 N. Harrison St.
PROVO, UTAH.....P.O. Box 310

Contractors Crane & Rigging Co. now has available in their Santa Ana, El Monte, Ontario and Rialto yards, two 80-ton P&H truck cranes with 250′ booms, one 60-ton with 200′ boom, one 50-ton P&H truck crane with 180′ boom and five 35-ton P&H truck cranes with 160′ booms. With the largest array of truck cranes in the United States, CC&R meets the needs and specifications of any job in their four-yard area.

User: MOUNTAIN ROCK COMPANY
Equipment: 60-TON P&H 595-TC TRUCK CRANE (owned and operated by Contractors Crane & Rigging Co.)
Project: Digging and loading rock at crushing plant, Claremont, Calif.

Contractor: CARTER COMPANY
Equipment: 35-TON P&H 555C-TC TRUCK CRANE (owned and operated by Contractors Crane & Rigging Co.)
Project: Office building construction in Pasadena, Calif.

One P&H always sells another...

3 MORE P&H TRUCK CRANES added to growing fleet of Contractors Crane & Rigging Company

Contractors Crane & Rigging Co., (formerly Heisler & Woods), has just added an 80-ton, a 60-ton and a 35-ton P&H truck crane to bring their total fleet of P&H machines to nine, working out of 4 yards in southern California. CC&R specializes in precast and prestressed erection, clam and drag operation and concrete pouring and special lifts.

The bonus capacity that comes from conservative P&H ratings and extra reserve power plus having a wide machine selection enables Contractors Crane & Rigging to take on any job from heavy lifts to setting lifts at 22 stories high.

Diversified work like this puts extra premium on machines which can handle it. CC&R can count on their P&H truck cranes because they all offer:

- Positive "inching" control of the boom—raised and lowered under power by P&H independent planetary boom hoist.

Contractor: CLYDE WOODS

Equipment: 80-TON P&H 775A-TC and 50-TON P&H 585A-TC TRUCK CRANES (owned and operated by Contractors Crane & Rigging Co.)

Project: Setting slip form for San Antonio wash channel, Pomona and Chino, Calif.

• Frictionless, electro-magnetic swings through MAGNETORQUE® which eliminates friction clutches, adjustments and maintenance—result in faster work cycles.

• Superior stability—because of one-piece, weaveproof frame and proper weight distribution of deck machinery.

These features produce for their owners and are the reasons why in the last four years, P&H sales have grown at a rate which substantially exceeds that of the industry as a whole.

For more information about P&H truck cranes of a specific size, or to set a date for a demonstration, call your P&H dealer—or drop us a note at the address below.

P&H

EXCAVATORS

½ • ¾ • 1 • 1½ • 1¼ • 2 • 2½ • 3 • 3½ yards

and CRANES

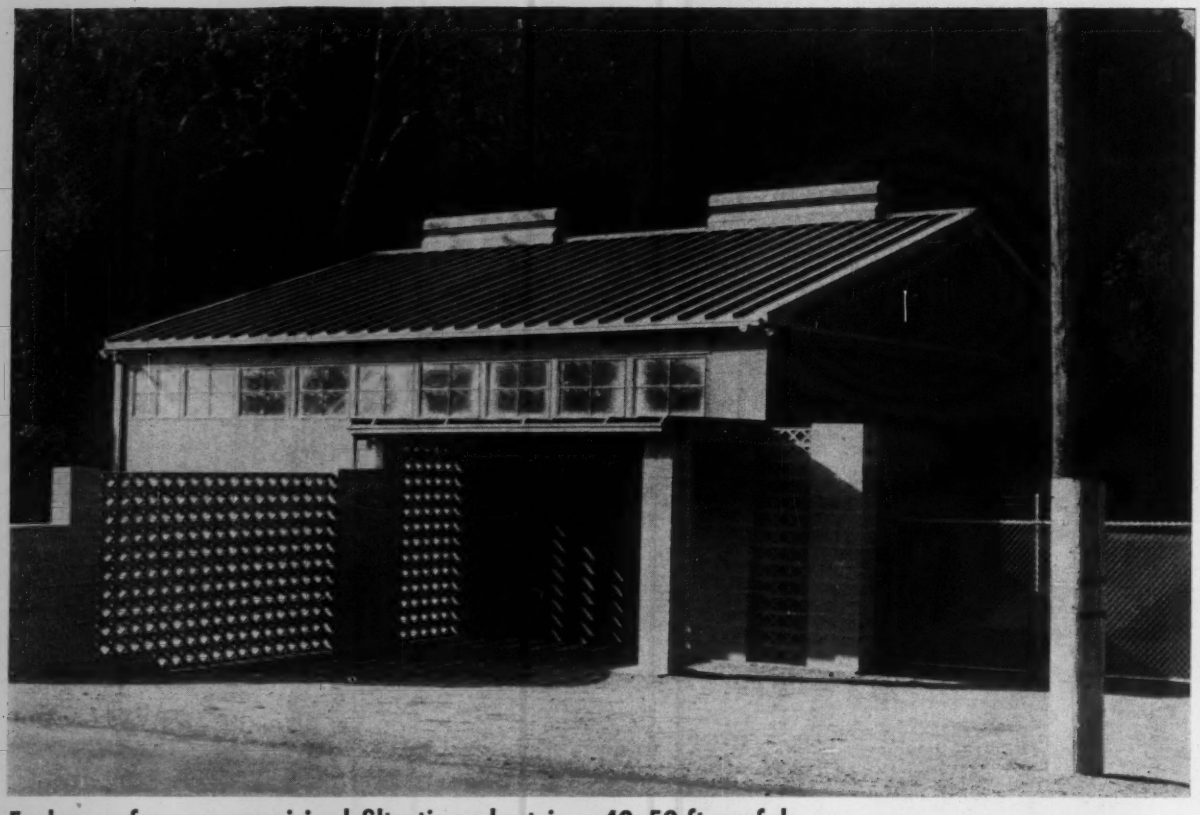
10 • 12½ • 15 • 20 • 25 • 30 • 35 • 40 • 50 • 60 • 80-ton

HARNISCHFEGER CORPORATION
Construction & Mining Division
Milwaukee 46, Wisconsin

OUR 75TH YEAR

See your P & H dealer . . . for your complete sales and service needs

JOE MONEY MACHINERY CO., INC. Birmingham, Alabama
REED EQUIPMENT COMPANY Mobile, Alabama
ARIZONA EQUIPMENT SALES, INC., Phoenix, Arizona
LYONS MACHINERY COMPANY Little Rock, Arkansas
K.C.Y. TRACTOR CO., LTD. El Cajon, California
TRINITY TRACTOR CO. Eureka, California
ALLIED EQUIPMENT COMPANY Fresno, California
BEALSHAW CORPORATION, Los Angeles 22, California
CASCADE INDUSTRIAL SUPPLY, INC. Redding, California
SHAPIRO EQUIPMENT CORP. Newington, Connecticut
NEFF MACHINERY, INC. Miami 37, Fla.
PANAMA MACHINERY & SUPPLY CO. Panama City, Florida
TRI-STATE TRACTOR CO. Atlanta 1, Georgia
STARLINE EQUIPMENT COMPANY Boise, Idaho
GLEASON EQUIPMENT CO. Chicago 8, Illinois
HUTTON MACHINERY COMPANY Marion, Illinois
KORTE BROTHERS, INC. Fort Wayne, Indiana
SOUTHWOOD MACHINERY SALES Indianapolis 27, Indiana
DUKEHART-HUGHES TRACTOR & EQUIPMENT CO., Des Moines 13, Iowa
HANSTROM-HUBLY TRACTOR CO. Marion, Iowa
PECAUT INDUSTRIAL SUPPLY CO. Sioux City 1, Iowa
NEWLIN MACHINERY CORPORATION Kansas City 3, Kansas
PATTERSON-REDMOND EQUIP., INC. Baton Rouge, Louisiana
CONTRACTORS EQUIP. CO. of LA., INC. Monroe, Louisiana
PINE TREE TRACTORS Augusta, Maine
LUTHERVILLE SUPPLY & EQUIP. CO. Lutherville, Maryland
ESCHENHEIMER CORPORATION Brighton 35, Massachusetts
GRAVES EQUIPMENT CO. Northampton, Massachusetts
EDDY & COMPANY, Lansing 4, Mich.
HUEBNER MACHINERY & SUPPLY CO. Saginaw, Michigan
PHILLIPPI EQUIPMENT CO. Duluth, Minn.
H. C. ORMES CONST. EQUIP. CO. Minneapolis 16, Minnesota
ALLIED EQUIPMENT, INC. Jackson, Mississippi
MISSOURI-ILLINOIS TRACTOR & EQUIP. CO. Robertson, Missouri
SEITZ MACHINERY CO., INC. Billings, Montana
TREASURE STATE EQUIPMENT CO. Kalispell, Montana
HIGHWAY EQUIP. & SUPPLY CO. Lincoln, Nebraska
A-D MACHINERY CO., INC., Elko, Nev.
NOBLE-BELISLE MACHINERY, INC. West Lebanon, New Hampshire
C. A. LIPPINCOTT & BRO., INC., Moorestown, New Jersey
JOHNSON & DEALAMAN, INC. Newark 5, New Jersey
CONTRACTORS EQUIP. & SUP. CO. Albuquerque, New Mexico
CONTRACTORS' SALES CO., INC. Albany 5, New York
DOW & CO., INC. Buffalo 7, N. Y.
MUNICIPAL MACHINERY CO., INC. Coram, New York (Long Island)
CONSTRUCTION EQUIPMENT CORP. Long Island City 1, New York
RALPH C. HERMAN COMPANY Marlboro, New York
CREDLE EQUIP. POTSDAM CORP. Potsdam, New York
CREDLE EQUIPMENT, INC. Utica, N. Y.
BUCK EQUIPMENT COMPANY Statesville, N. C.
GENERAL DIESEL & EQUIP. CO., INC. Fargo, North Dakota
RISH EQUIPMENT COMPANY Fifteen Branches in Ohio and the Virginias
BOARDMAN MACHINERY COMPANY Oklahoma City 7, Oklahoma
LOGGERS & CONTRACTORS MACHINERY CO. Portland 14, Ore.
STEPHENSON EQUIPMENT, INC. Harrisburg, Pennsylvania
A. T. GREEN MACHINERY COMPANY Pittsburgh 23, Pennsylvania
C. C. & F. F. KEESLER Prospect Park, Pennsylvania
ROADBUILDERS' EQUIPMENT, INC. Columbia, South Carolina
PECAUT EQUIPMENT COMPANY Sioux Falls, South Dakota
SOUTHLAND TRACTORS, INC. Memphis, Tennessee
REYNOLDS COMPANY Nashville, Tennessee
PLAINS MACHINERY COMPANY Amarillo, Texas
CENTRAL TEXAS EQUIPMENT CO. Austin, Texas
LUMBY MACHINERY COMPANY Dallas, Texas
PEARCE EQUIPMENT CO. OF TEXAS Houston, Texas
AIR MAC, INC., OF WASHINGTON Seattle 4, Washington
CARRINGTON COMPANY Seattle 4, Washington
DROTT TRACTOR COMPANY, INC. Milwaukee 8, Wisconsin
WILSON EQUIPMENT & SUPPLY CO. Cheyenne, Wyoming
HONOLULU IRON WORKS CO. Honolulu, Hawaii



Enclosure for new municipal filtration plant is a 40x50-ft prefab.

San Jose Installs a New 5-Mgd

A fully automatic, 5 mgd, diatomaceous-earth, filter plant is now in operation by a California water company. This follows a three-year development period by the utility and the manufacturer—respectively, the privately owned San Jose Water Works and the De Laval Turbine Pacific Co.

During the period a 250,000-gpd automatic plant was operated on a separate part of the water system. These installations are believed to be the first fully automatic diatomaceous-earth filter systems to be operated on a public water supply system.

There is nothing particularly new about diatomaceous-earth filtration. There are hundreds of such filters in industrial applications. And many are used in connection with swimming pools. There are even a few dozen manually operated units on public water supplies (ENR May 18, 1950, p. 35). To a great extent, however, such filters in swimming-pool and water-supply installations have suffered from poor operation. The result has been stringent requirements by some state health departments.

In the California case, the main requirement of the state health department is that there be no way in which raw water can pass through the plant or bypass the plant without filtration. This is taken care of by automatic controls that place the plant either on backwash cycle or on recirculation in case of power or equipment failure.

• **Local supply**—San Jose Water Works operates in the heart of the Santa Clara Valley about 50 miles south of San Francisco. Its supplies are all locally developed, much of the water coming from streams in the nearby mountains, supplementing supplies provided by wells.

Quality of the water from the streams is relatively good because of watershed control. But nevertheless, the water is fully chlorinated. However, there is occasional turbidity in the streams, particularly after heavy storms.

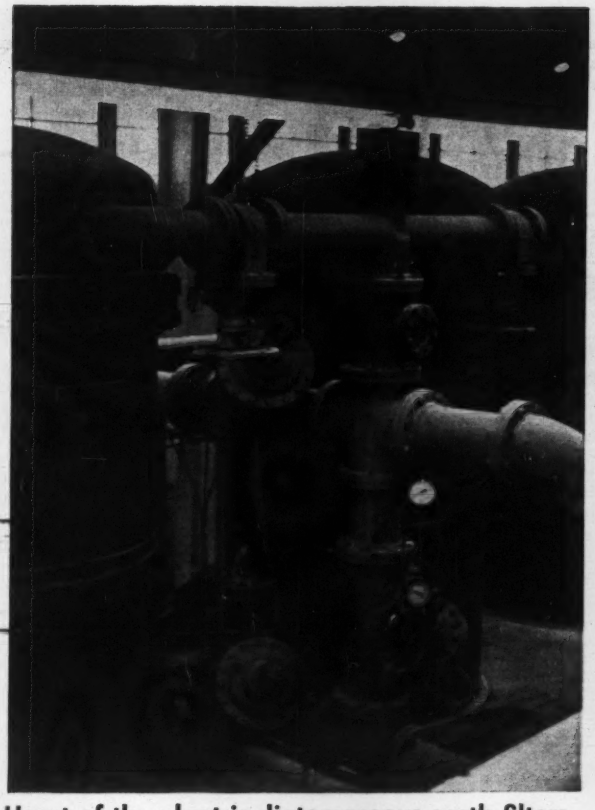
The new 5-mgd filter plant was installed at an intake on Saratoga Creek largely to remove turbidity. And it permits use of water which would otherwise be wasted. In the process, the filtering removes much of the bacteria content (estimates range from 90% to 98%). And this reduces by about 90% the amount of chlorination required by the water.

In addition to quality of the water produced, the main requirement imposed by San Jose Water Works for the new plant was that it be fully automatic. They felt that the cost of manning a filter plant 24 hr a day, 7 days a week would be prohibitive. This is one reason why rapid-sand filters were ruled out.

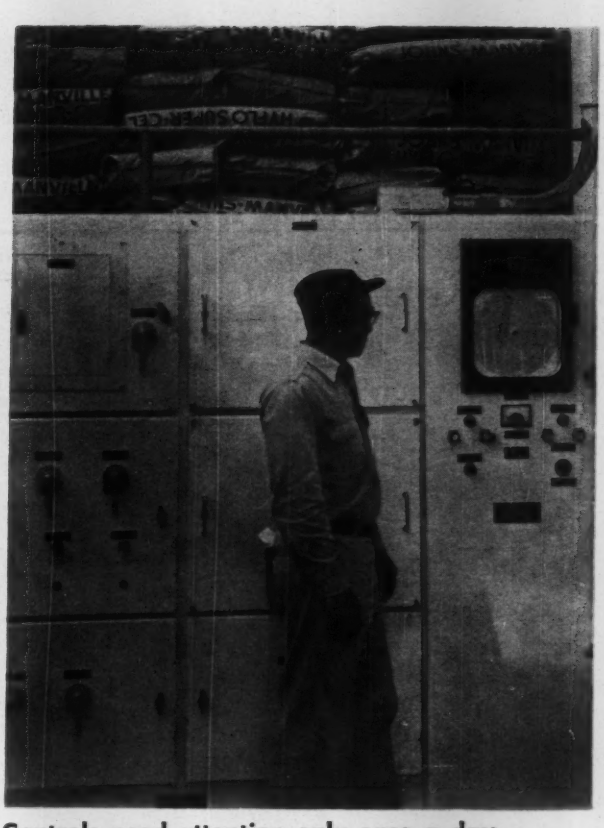
Another reason for not using sand filters is the space required. The diatomaceous-earth filter plant occupies a 40x50-ft prefabricated steel building with a small yard area. And no pretreatment (flocculation and sedimentation) is needed. Thus, the plant can be situated in a narrow canyon where space is at a premium.

Still another factor in favor of the present installation is the $125,000 cost (exclusive of land)—this was estimated to be about one-third of what a sand-filter plant would cost.

• **Equipment involved**—The Saratoga filter plant centers on four 60-in.-diameter filter tanks. They are grouped



Heart of the plant is diatomaceous-earth filters.



Controls need attention only once a day.

Automatic Filtration Plant

for normal operation in pairs. However, any number from one to four can be operated. Each tank is rated at 900 gpm for a filter rate of 1.6 gal per sq ft of filter surface per minute.

The filter surface in each tank is made up of 745 monel mesh tubes 3 ft long and 1 in. in dia, with openings equivalent to about a 200-mesh screen.

Other equipment in the plant includes a slurry mixer; a control board, which includes gages and solenoid activated switches; and a pair of variable-speed-drive pumps to feed the plant. No chlorination equipment is included as filtered water is piped to a nearby reservoir where the chlorination machinery was already installed.

• **Filter process**—In the diatomaceous-earth filter process, the filter tubes are first precoated with a thickness of about ⅛ in. of the diatomaceous-earth filter aid. This is done by injecting a predetermined amount of 20% diatomaceous-earth slurry into the raw-water side of the filters. This requires about 0.1 lb of filter aid per sq ft of surface area. The water and slurry are circulated in a closed cycle for the time calculated to coat the filters. Then, if the pressure drop through the filters is high enough to indicate that a complete coating is in place, the filter is placed "on the line." If the required pressure is not reached, the plant continues on recirculation cycle. This is one of the safeguards that prevent raw water passing through the plant

The diatomaceous earth is finely ground and will pass a 200-mesh screen. But shape of the particles is such that they stack up on the tubes much like pieces of straw. Turbidity and suspended solids stick to the filter medium rather than passing through.

After the filter cycle has started, additional diatomaceous earth is introduced at a predetermined rate along with the raw water. Thus, the diatomaceous earth piles up around the tubes as the filter cycle progresses. This is necessary to prevent the filters from clogging almost immediately. Eventually, however, the pressure drop through the filter units is so great that the backwashing cycle automatically starts. This removes the accumulation on the tubes and, after precoating the filter again, a new cycle is started.

Length of the cycle depends upon amount of turbidity in the water. Plant controls are arranged so that the filters are backwashed when pressure drop rises to about 32 psi. Pressure gages on inlet and outlet that are connected to solenoid switches regulate this operation.

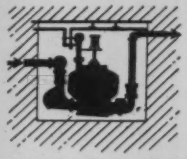
On turbidities running from 10 to 15 ppm, filter runs have averaged about 30 hours for filter rates of 1,800 gpm on the two-tank units. At 1,200 gpm, filter runs in early operation tests have averaged 50 hours.

Long-term operating results are not yet available. But for a period early this spring when the plant handled 1.3 mgd, some 350 lb of diatomaceous earth were needed daily.

Operating cost increases with turbidity. Estimates made for the Saratoga installation indicate that it would cost about $40 per mg to remove 100-ppm turbidity. Actually, San Jose Water Works officials would probably take the plant out of service should the raw-water turbidity average over 50 ppm for a period of time. Reason is that they could temporarily substitute well supplies. But normal turbidity is some-

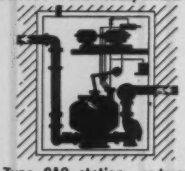
Which sewage lift station is best for your job?

TOPS IN DEPENDABILITY AND SAFETY



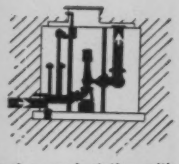
Concrete or steel underground station with Shone® Type S pneumatic ejector, mechanically controlled (warranted 25 years). Remote air supply. Nothing electrical; maintenance free, operates even under water. For municipalities and large subdivisions.

SURPRISINGLY VERSATILE, INEXPENSIVE



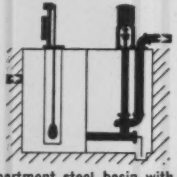
Shone® Type SAC station, underground in concrete vault. Mechanically controlled ejector (warranted 25 years) has its own compressor. Frequently less costly than package stations. Finds use everywhere.

PACKAGE STATION



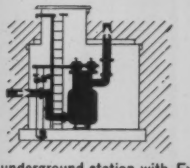
Quality underground station with vertical, short-coupled (Series 6260), dry pit centrifugal pumps. Quality design and equipment give good service life at nominal cost. For small permanent stations, growing areas.

LOW FIRST COST—EASY INSTALLATION



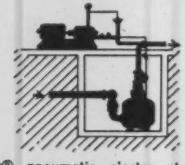
Two-compartment steel basin with centrifugal vertical wet pit pump. Pumps are not submerged; motors protected from flooding. Low first cost; fast installation. For buildings, small growing subdivisions.

ULTIMATE IN PACKAGE DESIGN



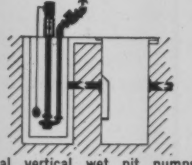
Package underground station with Expelsor® pneumatic ejector, electrode controlled. Sanitary and dependable, low maintenance, easy to service. Recommended for municipal and subdivision applications.

BUILDING TYPE STATION



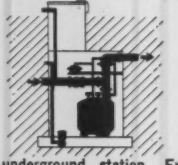
Expelsor® pneumatic ejector station designed for use in buildings. Compressor is on basement floor; ejector on floor below. Sealed installation gives safe, odorless handling of sewage indoors.

SPECIAL PROBLEMS?



Centrifugal vertical wet pit pumps with adjoining settling basin. Good for areas where sand or old sewers create problems. Special pump construction for abrasive or corrosive conditions, industrial wastes.

MAXIMUM RELIABILITY—MINIMUM SPACE



Package underground station. Expelsor® pneumatic ejector has two compartments, duplex compressors and controls. Excellent service accessibility. Especially suited for subdivision and municipal lift stations.

L-5911

The answer depends on the job. Is it to be a temporary station? What about future loads? How much maintenance will it get? What type of power is available? These and many other questions must be weighed carefully and without bias. In making the decision, why not put Yeomans 61 years' experience (59 on underground stations alone) to work? Because Yeomans builds **the only complete line** of sewage lift stations in the industry, recommendations are **impartial** and in your best interest. Phone, wire, or write now.

YEOMANS

1999-1 North Ruby Street, Melrose Park, Illinois

SPECIALISTS IN SEWAGE LIFT STATIONS—THE COMPLETE LINE

what less than 20 ppm. Occasionally during sudden rains or upstream earth slides the turbidity may rise rapidly to, say, 4,000 ppm for an hour or so. The plant is well able to take care of such peaks.

• **Non-clogging slurry feed**—Key to the automatic operation of the plant is the method developed by De Laval Turbine Pacific Co. for introduction of diatomaceous-earth slurry. It is an almost foolproof non-clogging system. Slurry is fed by an eductor (water jet). Separate eductors are used for precoat and for body feed. The precoat eductor is a 1½-in. unit and the body-feed eductor is a ½-in. unit. And both eductor systems are automatically back flushed to prevent clogging.

Some other systems of slurry feed have used slurry pumps. But in almost all cases these fail due to the abrasiveness of the filter aid material. Or they clog if the slurry is not thoroughly mixed. It appears that these drawbacks to automatic operation have been overcome by the eductor method of slurry injection.

Plant operations are controlled by air-operated valves. These are so mounted that in case of a power failure or a failure in the air supply to the valves, the plant automatically shuts down in the backwash position. Thus, before the plant can be put back in service the backwash cycle must be completed and the filter screens recoated.

The effect of all these automatic controls is that the plant can be operated on a one-visit-a-day basis. The operator, who also operates a number of pump stations for the water system, changes the charts on the automatic recording instruments. And he refills the slurry tank with diatomaceous earth and water.

A gage on the inside of the slurry tank tells the operator how many 50-lb sacks of the filter aid to add. As he does this, he refills the slurry tank with water and the resulting slurry is a 20% solution.

The operator on his daily visit can also adjust the amount of filter aid introduced in the body-feed cycle. For each 1 ppm of turbidity, filter aid is introduced at a 1-ppm rate. Thus, to remove 15 ppm turbidity, diatomaceous earth would be introduced with the raw water at a 15-ppm rate. A recording turbidometer shows the raw- and filtered-water turbidity (usually zero in the latter case). And a simple dial setting regulates slurry feed.

The plant was designed by the San Jose Water Works staff under the direction of N. J. Kendall, chief engineer. Filter design was by the staff of the De Laval Turbine Pacific Co. of Millbrae, Calif.

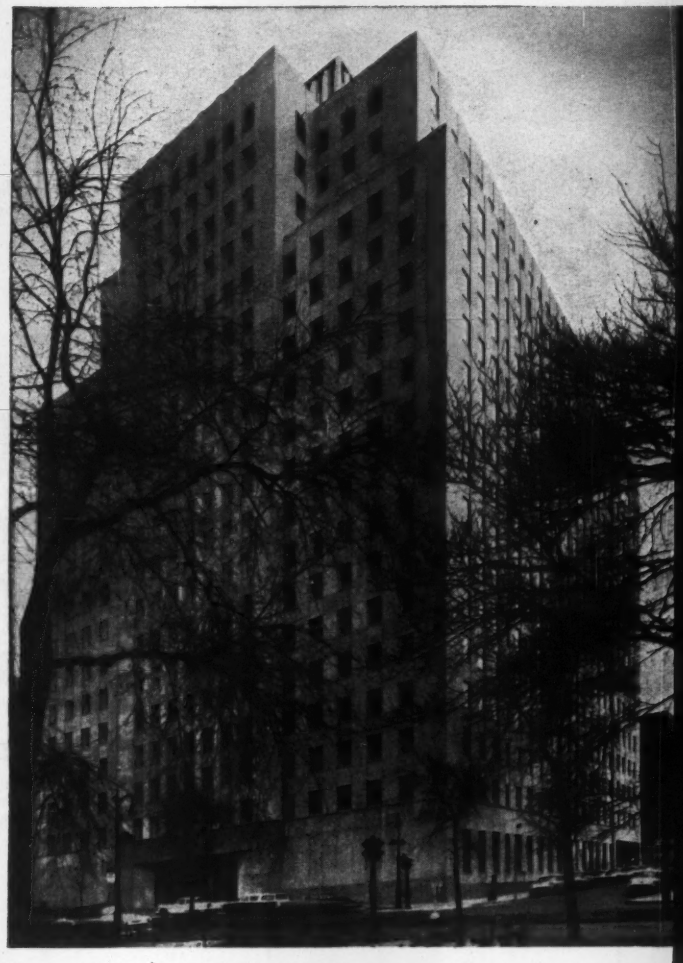


Photo courtesy of Turner Construction Company

Built to an "Only the Best" specification

. . . equipped with JENKINS VALVES

The Interchurch Center
New York City

Poised on a bluff 100 feet above the Hudson River, this $21 million structure houses 2,000 individuals representing 144,000 local Protestant and Orthodox congregations embracing 40,000,000 members in the United States. Its imposing limestone facing alone represents a substantial investment in beauty as well as permanence.

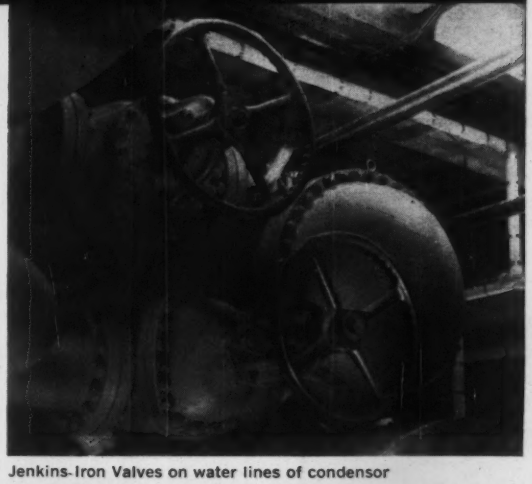
Architects: Collens, Willis & Beckonert—Voorhees Walker Smith Smith & Haines. *General Contractor:* Turner Construction Company. *Plumbing Contractor:* C. H. Cronin, Inc. *Heating, Ventilating, Air Conditioning Contractor:* Raisler Corporation.

A magnificent culmination to a fifty-year dream of bringing Protestant and Orthodox communions in America together under one roof, The Interchurch Center is an outstanding New York building, as well. It is especially noteworthy for an overall high quality in construction and equipment. Planned to be a symbol of unity that would endure for generations, architects and contractors could be satisfied only by "the best" in everything.

When it came to valves for both the central air conditioning system and the heating system with its three low pressure boilers, all building factors agreed on JENKINS. They could be sure Jenkins Valves would deliver an unusual measure of long-time efficiency and economy. And, as practical planners, they appreciated the fact that Jenkins Valves cost no more than any good valves.

When YOU choose valves, remember that you pay no premium to specify the valves so often favored by the country's top building authorities. Jenkins Bros., 100 Park Ave., New York 17.

SOLD THROUGH LEADING DISTRIBUTORS EVERYWHERE



Jenkins-Iron Valves on water lines of condensor

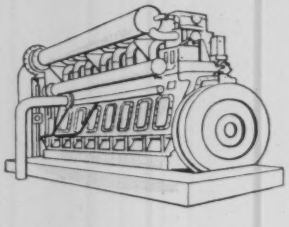
JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES
JENKINS SINCE 1864
Jenkins Bros

PUBLIC WORKS

Match your wits against this team of

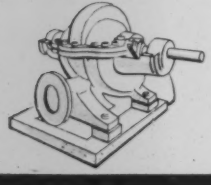
Q-1 As landmarks in water works leadership, Worthington built the:

- ☐ First duplex pump for municipal use
- ☐ The largest water works installation in 1908
- ☐ World's most efficient pumps in 1927



Q-2 The trend in large water works pumps is:

- ☐ To horizontals
- ☐ To verticals
- ☐ There is no trend



Q-3 A Worthington Tri-Power Engine operates on the following fuels:

- ☐ Sewage gas and oil
- ☐ Natural gas and sewage gas
- ☐ Butane and oil

Q-4 Greatest accessibility for service is offered by:

- ☐ Vertical turbine pumps
- ☐ Horizontal double-suction split case pumps
- ☐ Propeller pumps

Q-5 You get maximum hydraulic head flexibility from Worthington:

- ☐ Vertical turbine pumps
- ☐ Horizontal double-suction volute pumps
- ☐ Mixflo centrifugal pumps

Q-6 Sewage from a city of 1,200,000 persons produces enough gas to generate:

- ☐ 400 hp.
- ☐ 1200 hp.
- ☐ 4400 hp.

Q-7 A sewage system is capable of generating how many cubic feet of gas per person per day?

- ☐ One-half cubic foot
- ☐ One cubic foot
- ☐ Two cubic feet

Q-8 Heat recovery from jacket water, lube oil, and recoverable exhaust heat can boost engine efficiency at full load as high as:

- ☐ 37.5%
- ☐ 58%
- ☐ 76%

Q-9 Worthington pumps can be used on:

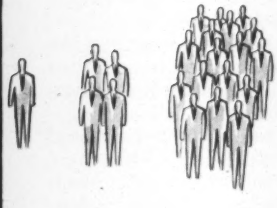
- ☐ Raw sewage
- ☐ Effluent
- ☐ Sludge

ANSWERS: (NO PEEKING)

A-1 Worthington was the first to build all three, as well as many other water works "firsts". **A-2** There is no trend. The particular application is most important. **A-3** Tri-Power engines are readily convertible to spark ignition and so handle any or all of the combinations mentioned. **A-4** Split-case horizontal pumps provide most accessibility. **A-5** Worthington vertical turbine pumps offer maximum head flexibility by varying the number of stages for different head requirements. **A-6** At 600 BTU per cubic foot, and 1,200,000 persons, Worthington engines can produce 4400 usable horsepower. **A-7** One cubic foot of gas per person per day is usually used for estimating purposes. **A-8** Proper utilization of heat from a Worthington engine can make it as high as 76% efficient, as compared with 37.5% without any heat recovery. **A-9** All 3. Worthington pumps handle every liquid handling problem in sewage work. **A-10** Several suppliers—no one does everything. But Worthington handles engines, compressors, comminutors, pumps and auxiliary equipment, so a major share of responsibility can be placed in one direction. **A-11** In 1934 Worthington placed the first engine running on sewage gas in service. **A-12** Use of multi-speed pumps

PLANNING QUIZ

Worthington public works specialists



Q-10 On complex water pollution control systems, it is best to work with:

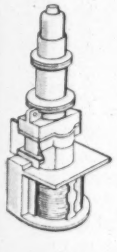
- ☐ One supplier
- ☐ Several suppliers
- ☐ Many suppliers

Q-11 Worthington produced this landmark in sewage plants—the first:

- ☐ Engine operating on sewage gas
- ☐ Agitated digesting tank
- ☐ Automatic, full-flow chlorinator

Q-12 An economical way to provide for additional pumping capacity is:

- ☐ Leave space for duplicate pumps
- ☐ Buy larger pumps initially
- ☐ Use multi-speed pumps

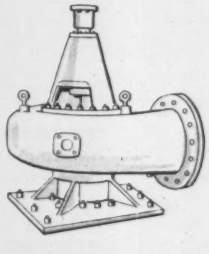


Q-13 A comminutor is most effective when installed:

- ☐ Upstream from a grit chamber
- ☐ Downstream from a primary settling tank
- ☐ At inlet to wet well of sewage lift station

Q-14 Pumps manufactured by Worthington are tested at test stand which:

- ☐ Is built over a man-made half-acre lake
- ☐ Is the world's largest
- ☐ Has capacity up to 100,000 GPM



Q-15 For Mixflo pumps, Worthington has the greatest:

- ☐ Selectivity
- ☐ Number of patterns
- ☐ Range of models

Q-16 Worthington makes which of the following?

- ☐ Clarifiers
- ☐ Filters
- ☐ Compressors

Q-17 A Worthington 36" comminutor handles:

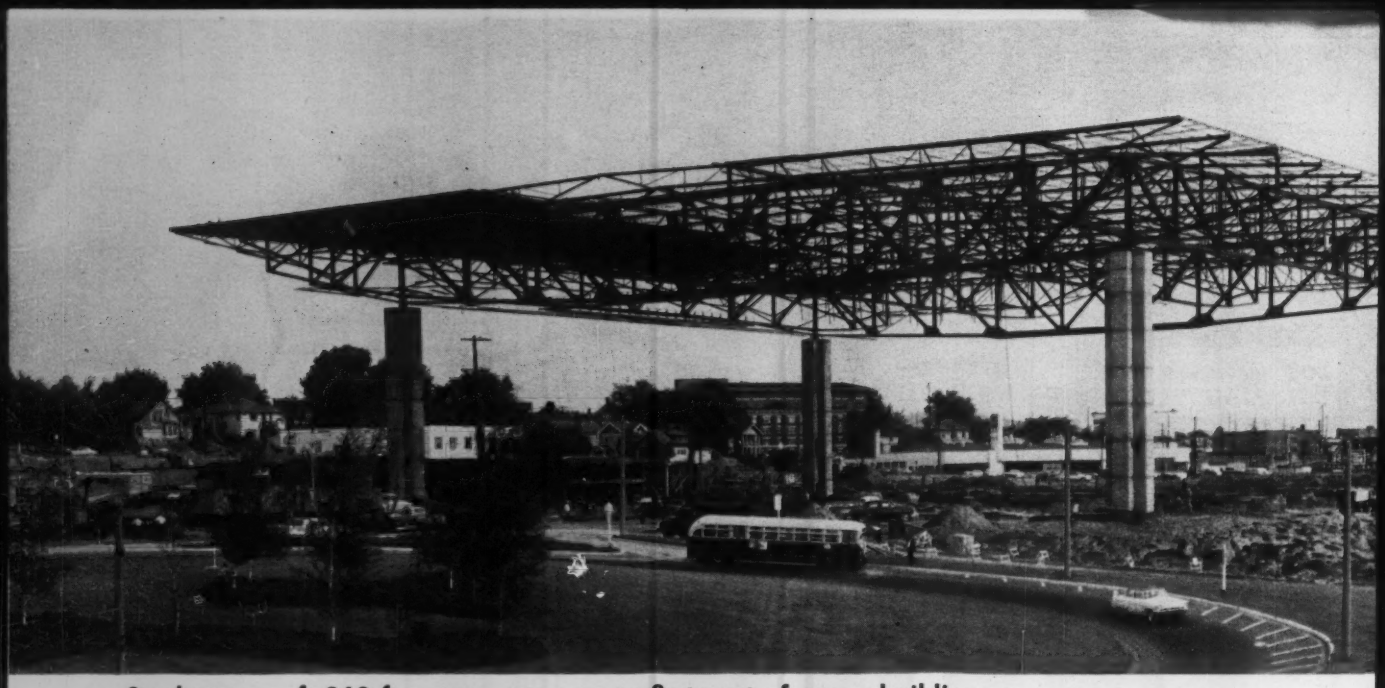
- ☐ 0.2 to 3.0 mgd. peak
- ☐ 3.0 to 11 mgd. peak
- ☐ 2.0 to 26 mgd. peak

Q-18 Which reason justifies paying extra for variable speed pumping units?

- ☐ Pumping rates are always matched to flow
- ☐ Surges are avoided
- ☐ Wet wells can be smaller

will cost slightly more initially, but can provide substantial increases in capacity at lowest long run cost. **A-13** At inlet to wet well of sewage lift station. For a treatment plant *downstream* from grit chamber and *upstream* from primary settling tank. **A-14** All three are right. Worthington's test stand built over a half-acre lake has a 100,000 GPM capacity and is world's largest. **A-15** Building Mixflo pumps since 1920, Worthington has accumulated the largest number of patterns and thus has the greatest selectivity with the largest number of models. **A-16** Worthington makes compressors—and matches vacuum pumps to the filters, but it does not make them or clarifiers. **A-17** The 36" comminutor handles up to 26 mgd peak. Smaller models handle as little as .02 mgd efficiently. **A-18** All three reasons justify extra cost of Worthington variable speed pump installations.

WORTHINGTON



Steel truss roof, 360 ft square, goes up as first part of arena building.

Double Structure Is Bowl-in-Box

With an eye on a November opening date, construction crews worked through the winter months—under cover—on a Portland, Ore., building that will look very much like a bowl in a glass showcase. Contractors have pushed their work on the concrete arena of Portland's Memorial Coliseum, protected by the completely independent structure of the building's great steel truss roof.

Standing 120 ft high, the square coliseum building forms the focal point of the 21-acre Exposition-Recreation Center across the Willamette River from downtown Portland. In addition to the coliseum, there is an exhibition hall, meeting and assembly facilities, a war memorial and parking for 1,900 cars.

Inside the coliseum itself, a circular, arena bowl will give up to 13,500 spectators an unobstructed view of the entire arena floor. Over this bowl sits the 360-ft square steel deck roof. Glass curtain walls box in the structure from roof spandrel to ground.

The coliseum roof rests on only four piers spaced in a 240 x 270 ft rectangle. These four piers rise 95 ft through the structure from single spread footings 24 x 24 x 4 ft deep. Expansion joints separate the piers from the inside structure where they pass through a concourse level just outside the bowl.

Like a shallow soup bowl, the arena is circular at its rim but has an elongated bottom. And rather than resting on a dish—the concourse level—it extends through it. At center, the arena floor measures 120 x 248 ft. At its outer rim, the bowl is 330 ft across. The concourse level, outside the bowl and 19 ft above the arena floor, forms the plate of the combination, providing both access to the arena seats and exhibition floor space within the coliseum.

The cross-shaped roof piers (12½ ft square with 5-ft thick wings) were cast in nine lifts each. But this wasn't simply a mass concrete operation. Actually, five ducts rise through each pier to house mechanical and electrical lines. In addition, there's a hydraulic elevator rising through one pier by which maintenance crews can reach the roof.

During construction, steel crews erected the roof framing in record time but followed a carefully laid plan designed for greatest possible safety.

Two main trusses extend the 270 ft distance between piers and extend 45 ft beyond at each end. These trusses carry four transverse trusses that span across the building and cantilever 60 ft out on each side. They frame through the main trusses over the corner piers and at third points between them.

The erectors, Steel Construction Company of Oregon, set the first main truss on high timber bents placed at the lower chord panel points. At the same time, ironworkers "turned the corner", erecting the first panels of the end transverse trusses—on timber bents—to give all possible stiffness to the first main truss.

Next step: work across the end of the rectangle, placing an end cross truss to tie the erection work on three piers as soon as possible and provide timber bent support in two directions.

After this, the main truss across the building went up and at the same time other crews started erecting the remaining three cross trusses.

Heaviest lift was 16 tons—top chord sections of the main trusses. These were two 14WF314 sections with flange edges welded together to form a box-and-channel shape.

Rigging gangs carried lines to both top and bottom chords of each truss, tieing them to deadmen in four directions. At height of the erection activity, there were over 150 lines from both steel and timber to ground level.

Juncture between piers and the truss structure are moment-free ball and socket joints. At the bottom, there is a 5-ft square base plate 5½ in. thick placed on each pier. Above this comes an 18-in. square, 6 in. thick bearing plate that carries a stainless steel, 10-in.-dia hemisphere. On the top, there is a 9-in. thick sole plate welded to the truss directly over the pier. This 20 x 24-in. plate is machined with a matching hemispherical pocket to complete the joint. The truss post over it, common to both main and cross trusses, is the heaviest section in the roof design at 14WF426.

Main trusses are 24 ft deep over the pier joints and 30 ft deep at midspan. The four cross trusses, 22 ft deep, frame through the top chords of the main trusses.

SECOND PART—concrete bowl arena—is independent of the roof.

Auditorium

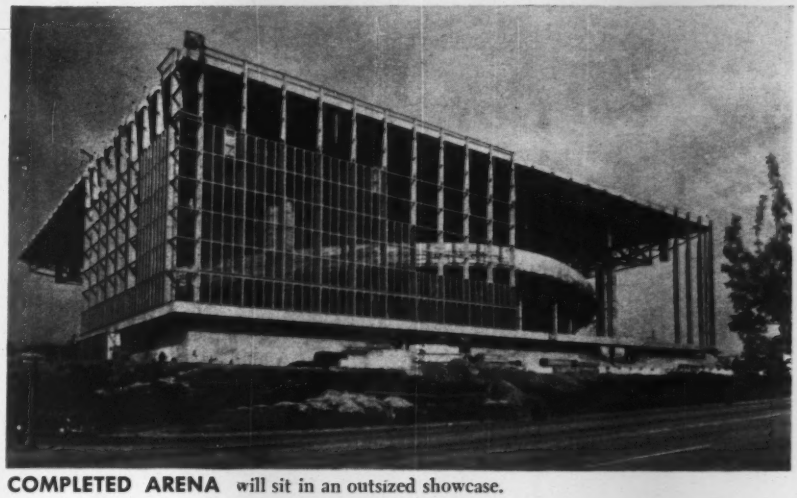
The steel fabricators, Poole, McGonicle & Dick of Portland, riveted and bolted all shop connections for the main trusses. A-242 steel was included where possible in the total 1,250 tons to help reduce weight of the roof. Shop crews welded all open web purlins that span between the trusses.

In the field, all connections were bolted. Only field welding was at points with no calculated loading.

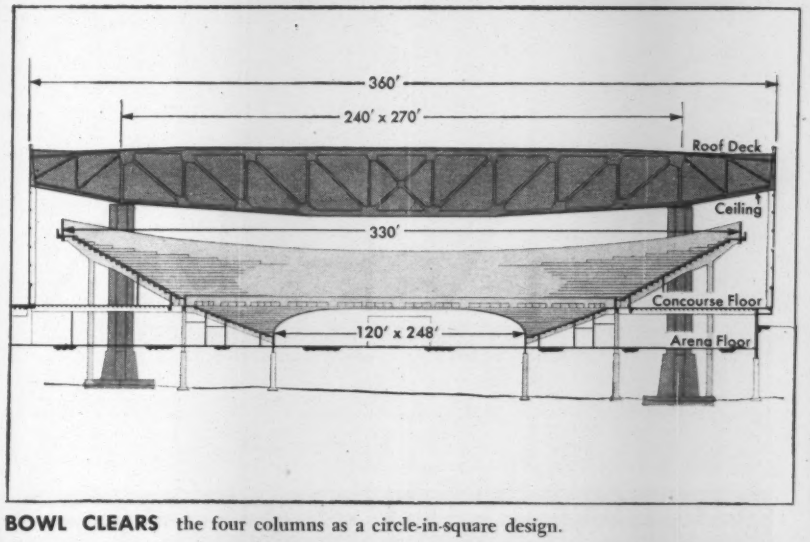
The roof deck of the final structure—steel panels with concrete fill—acts as a monolithic diaphragm to help pass wind loads from the exterior walls through the truss framing to the reinforced concrete piers below.

Under cover of the permanent roof, Hoffman Construction Co., the general contractor, began work on the arena and concourse structure. The bowl and the concourse level are conventional reinforced concrete in design but construction has been another story. Thirty-six radial seat deck frames extend out and up from a wall around the 120 x 248-ft arena floor, with a flat break at the concourse level. When these frames reach the rim of the seating bowl, its shape has changed from the elongated arena plan to a circle.

In addition, the perimeter elevation varies, creating a saddle shape in profile. Carpenters building forms for the cast-in-place seat frames have few lines that are similar. Measurements vary for each member in any one quadrant of the seat bowl. All frames are 24 in. wide but vary in depth depending upon the

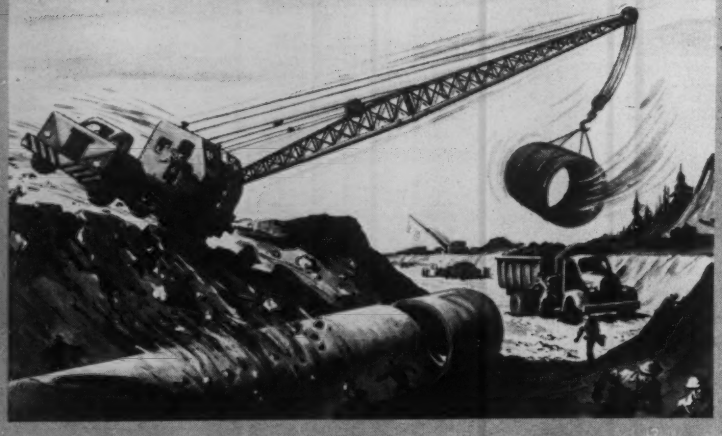


COMPLETED ARENA will sit in an outsized showcase.



BOWL CLEARS the four columns as a circle-in-square design.

ACCIDENTS ARE THE SAME THE WORLD OVER



. . . But Not Your Liability!

That is why sound insurance protection on your interests overseas must be written and serviced by qualified experts on the laws and insurance regulations of the countries where your operations are located.

The American Foreign Insurance Association has been a leader for decades in providing American business ventures abroad with just that kind of protection . . . steadfast protection founded upon professional observation of local conditions and the laws of nearly every country in the world.

No matter what your business or where it is located in foreign lands AFIA, through its member companies, protects it with the "right" insurance for your specific needs.

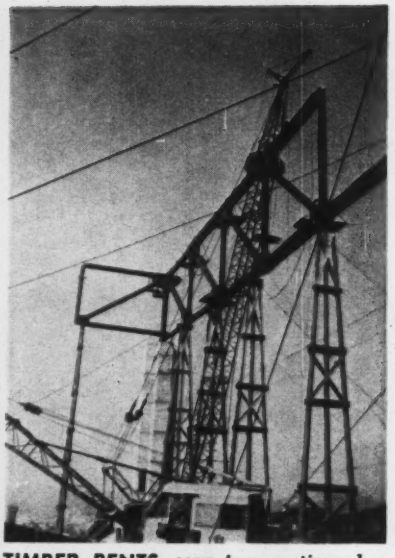
Ask your agent or broker to get full information for you from AFIA.

AFIA

AMERICAN FOREIGN INSURANCE ASSOCIATION
161 William Street • New York 38, New York

CHICAGO OFFICE . . Insurance Exchange Building, 175 West Jackson Blvd., Chicago 4, Illinois
DALLAS OFFICE . . . . . 400 Vaughn Building, 1712 Commerce Street, Dallas 1, Texas
HOUSTON OFFICE . . . . . The Century Building, 2120 Travis Street, Houston 2, Texas
LOS ANGELES OFFICE . . . . . 3277 Wilshire Boulevard, Los Angeles 5, California
SAN FRANCISCO OFFICE . . Russ Building, 235 Montgomery Street, San Francisco 4, California
WASHINGTON OFFICE . . . . Woodward Building, 733 15th Street N. W., Washington 5, D. C.

An association of leading American capital stock fire, marine, casualty and surety insurance companies providing insurance protection in foreign lands



TIMBER BENTS carry truss sections during erection. Guy cables brace components.

length of span between the supports.

Precast, inverted L-shape seat deck units span between the frames providing a 2 ft 8 in. tread and a rise varying from 1 ft to 1 ft 6 in.

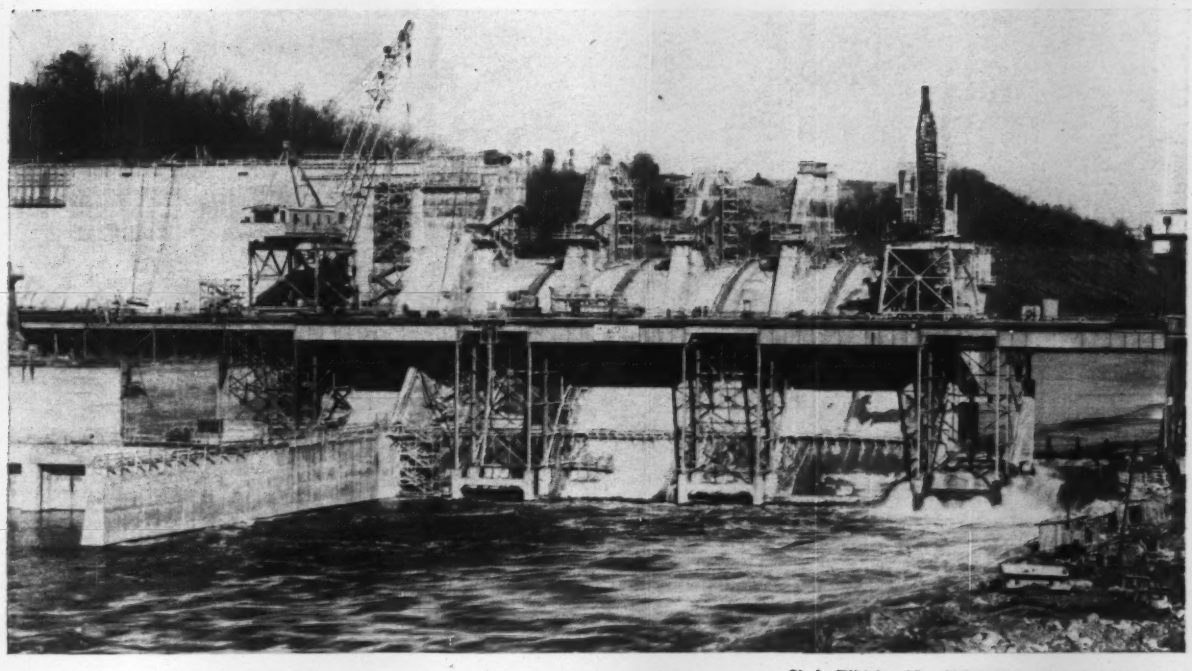
Concourse level framing is conventional reinforced concrete beam and joist construction designed for 100 lb live load or a concentrated load of 10,000 lb to permit forklift trucks to run on the floor.

The entire building will be wrapped in a curtain wall of clear gray glass. Glued, laminated timber mullions, 15 ft c-c, rise 83 ft from the concourse level to the edge of the roof deck. Aluminum sash support ⅜- and ¼-in.-thick glass in 3-ft 6-in. x 9-ft panels between mullions. Entire weight of the curtain wall rests on the concourse level. Joints at the roof permit vertical movement alone—restraining the wall and passing wind loads to the roof frame.

When completed in the fall, the center will represent a total investment of $8 million by the City of Portland. Construction contract for the coliseum went to the Hoffman Construction Co., Portland, at $5.4 million. Largest nonconstruction expense was about $1.9 million for property acquisition and demolition of buildings on the site.

Architect for the project is Skidmore, Owings & Merrill, Portland.

Structural engineers are Moffatt, Nichol & Taylor; electrical engineers are Grant Kelley & Associates; mechanical engineers are J. Donald Kroeker & Associates. Empire Prestressed Concrete Co., produced the precast concrete elements for the project; Mercer Steel Co was contractor for the roof deck work and Vermiculite-Northwest, Inc., handled concrete work for the roof deck. All are Portland firms.



Clyde Whirley No. CW-3264 on Douglas Dam job. Also shown is No. CW-3266, now in use at Widows Creek Steam Plant near Stevenson, Ala.

Performance record of Crane No. CW-3264 shows why

Clyde Whirleys are best for dam construction

The severest appraisal of value of a machine is its record of performance . . . its use and re-use on work for which it has been engineered. Continued re-use over many years writes a record of longevity of useful **and profitable** service such as this record of Clyde Whirley No. CW-3264:

1940 Received new at Cherokee Dam near Jefferson City, Tenn.

1942 Douglas Dam near Dandridge, Tenn.

1943 Fontana Dam near Bryson City, N. C.

1946 Sold. Used at Davis Dam near Kingsman, Ariz.

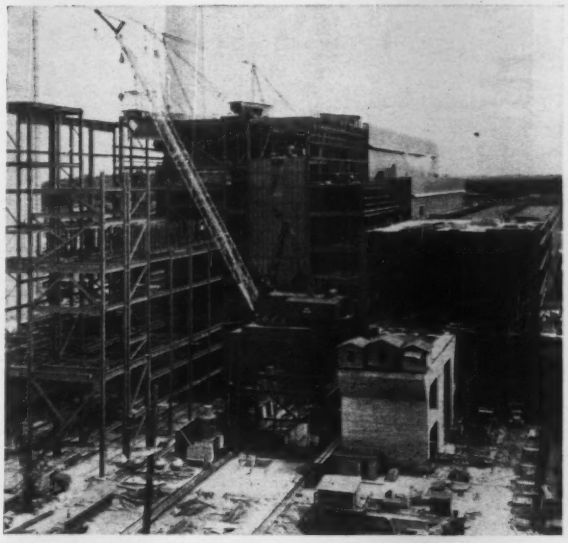
1950 Re-purchased by original owner. Used at Boone Dam near Elizabethton, Tenn.

1952 Fort Patrick Henry Dam near Kingsport, Tenn.

1953 Gallatin Steam Plant near Gallatin, Tenn. through 1959.

1960 Colbert Steam Plant near Tuscumbia, Ala.

Pre-World War II and into the 'sixties'! Re-purchased by the original owner! What better recommendation for the quality engineering and rugged and dependable construction of Clyde Whirleys . . . or any other material handling equipment that bears the Clyde trademark?



Clyde Whirley No. CW-3264 at work on the Gallatin Steam Plant. Boom length has been increased to 167'. Gantry has been increased to 62' and will be increased to 95' for Colbert Steam Plant job. Hoist motor size has not been increased.

. . . and No. CW-3264 is still in the prime of its youth!

CLYDE IRON WORKS, Inc.

Established 1899

DULUTH 1, MINNESOTA

A SUBSIDIARY OF RIC REPUBLIC INDUSTRIAL CORPORATION

HOISTS • DERRICKS • WHIRLEYS • BUILDERS TOWERS • UNLOADERS • CAR PULLERS • ROLLERS

GOES TO BED WITH ITS WORKING CLOTHES ON

From the moment it is installed, cast iron pipe begins working—will deliver its full flow of water for over a century.

Here in Kansas, as part of a major water expansion program, 15,000 feet of cast iron pipe were put to bed. Ease of assembly, bottle-tight joints, and assured full-flow capacity through cement lining were important factors in the selection of cast iron pipe.

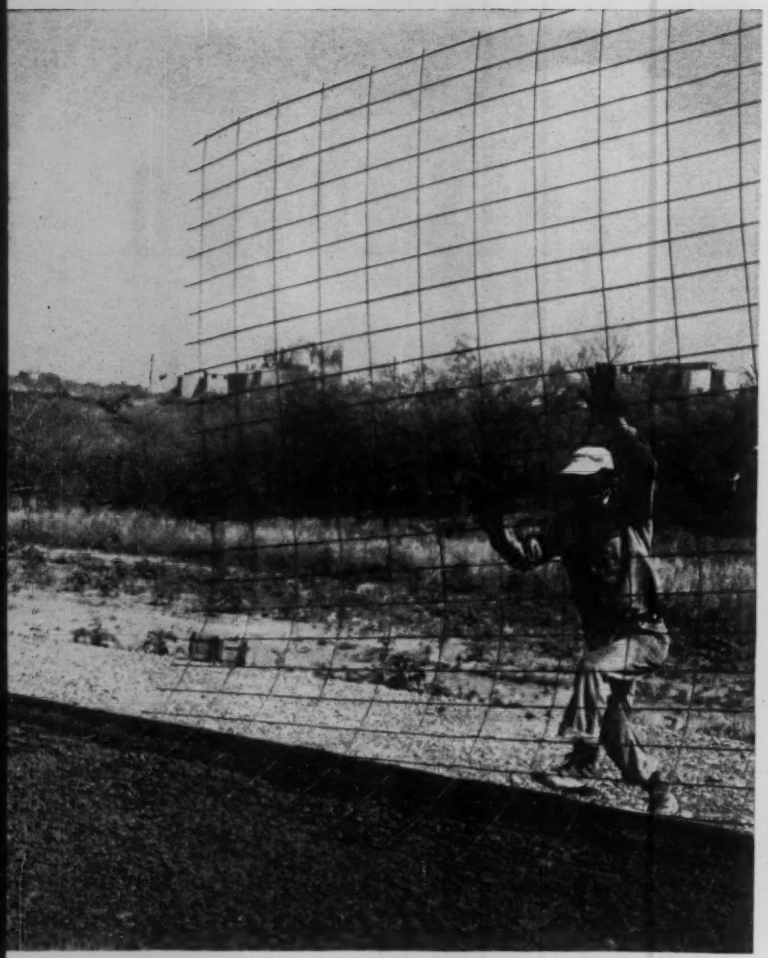
An interesting feature was the uncovering of distribution mains constructed of cast iron pipe manufactured in 1887. The pipe was in excellent condition and was put back in water service.

Cast iron pipe is always working. In fact, once it is installed, one can generally anticipate no major repairs or replacements for at least a century.

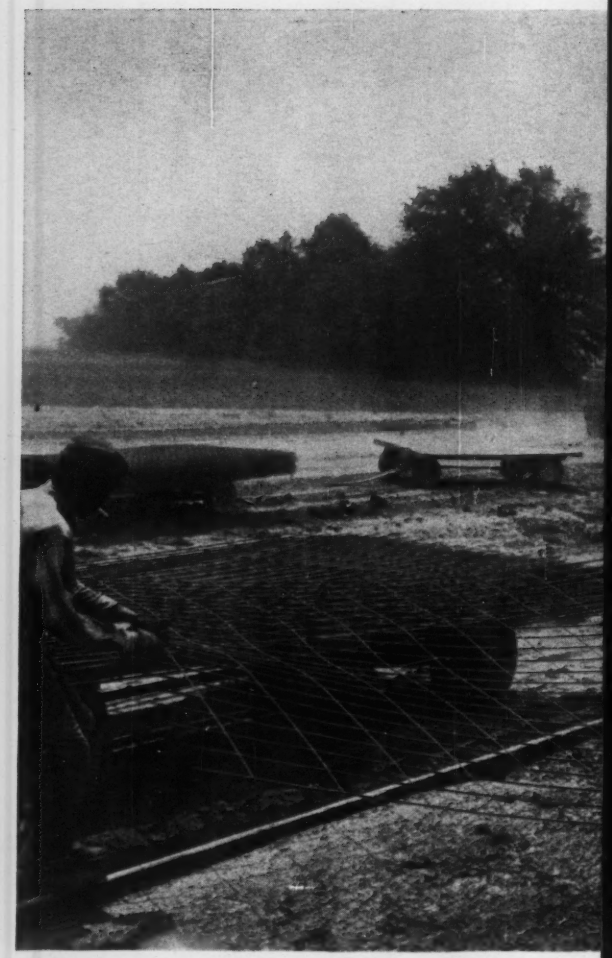
CAST IRON PIPE RESEARCH ASSOCIATION,
Thos. F. Wolfe, Managing Director,
3440 Prudential Plaza, Chicago 1, Illinois

CAST IRON PIPE

THE MARK OF THE 100-YEAR PIPE



Older method of handling steel gives way to . . .



rubber-tired trailer pulled along outside

Reinforced Concrete Pavements—

By Henry Aaron

Thirty-two state highway departments are now specifying distributed reinforcing steel for concrete pavements continuing a trend that resumed after World War II with its emergency restrictions on steel.

Larger steel dowels are in common use for load transfer at pavement joints. And another developing trend is the mechanized handling and placing of the reinforcing steel.

As late as 1955, only 20 states and the District of Columbia required use of reinforcing steel in concrete pavements. Primary reason that more do now is the performance of reinforced pavements under ever-increasing volumes of heavy truck traffic.

The 32 states specifying reinforcing have more than 75% of the mileage of concrete pavements on state highway systems. In addition there are about 2,000 miles of toll highways paved with concrete, and more than 95% of this mileage is reinforced.

Engineers select reinforced design for two principal benefits: lower maintenance costs and higher operating efficiency, with few interruptions to traffic.

Among designers there is increased recognition of the benefits of reinforcing distributed throughout the slab. It has become an accepted fact that the steel aids in distribution of stresses during hardening of the concrete and thus overcomes the tendency to develop excessively wide cracks while the concrete is still weak. Any cracks that do develop are held tightly closed by the reinforcing steel. Because the steel prevents progressive opening of the cracks, it safeguards the load-carrying capacity of the slab.

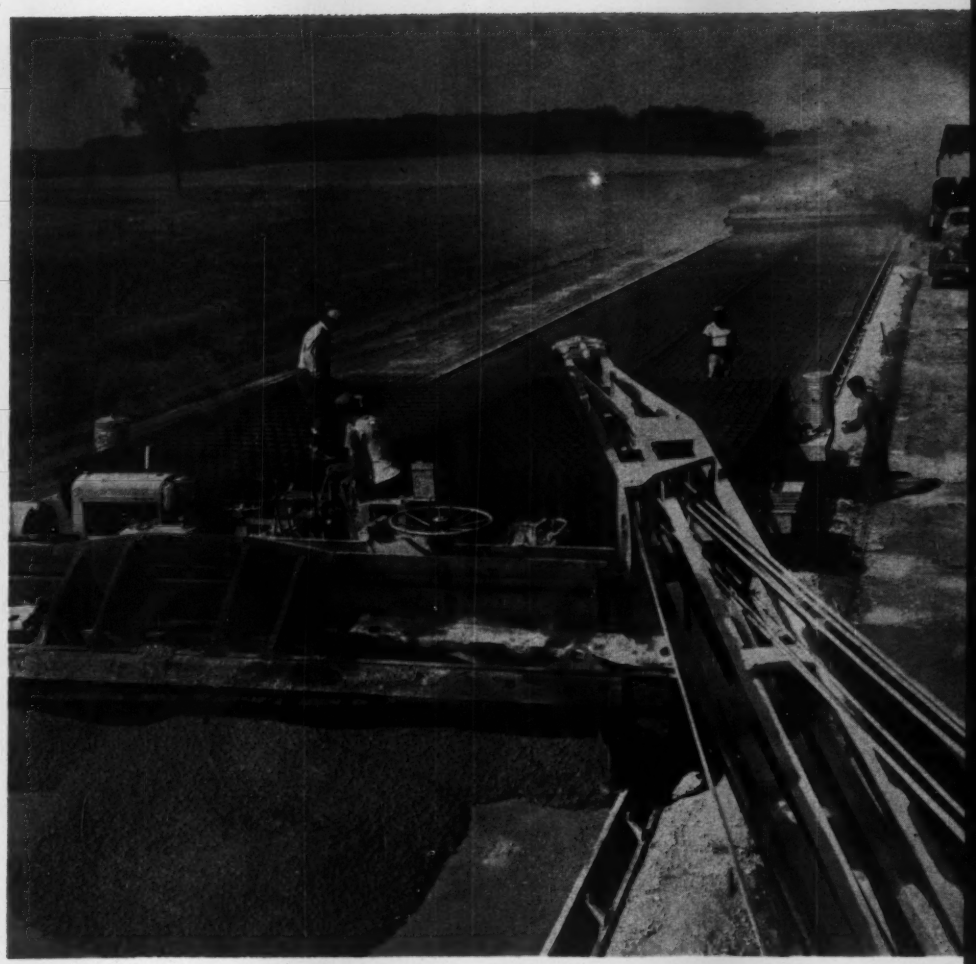
In spite of this behavior it has not been customary to give credit to the steel for increasing the structural strength of the pavement slab. Designers generally have considered that the steel specified in pavement slabs (relatively small in amount as compared to the requirements for a free-span structural slab) served only to prevent excessive opening of cracks and permitted the use of longer slabs than would be possible with a nonreinforced slab.

However, surveys of pavements under actual service conditions, as well as investigations under controlled traffic, have demonstrated the structural benefits resulting from incorporation of reinforcing steel.

Current state highway department

Mr. Aaron, former Chief of Airports Technical Branch, CAA, earlier put in 20 years with the Bureau of Public Roads. He is Chief Engineer, Reinforced Concrete Pavement Division, Wire Reinforcement Institute.

the forms or . . .



rig pulled by spreader, with steel for 2,000 ft of pavement.

More of Them, and Stronger

practice calls for reinforced slabs ranging from 40 to 100 ft in length. Twenty of the 32 states which require steel reinforcement specify slab lengths between 60 and 100 ft. Slab thicknesses range from 8 to 10 in., depending on weight and volume of traffic and soil and climatic conditions.

Size and spacing of steel members are generally found by the "subgrade-drag formula", which determines the area of steel required to resist—with a specified factor of safety—the tensile stresses at a crack due to the frictional resistance between slab and subgrade.

The formula is $A_s = FLw/2f_s$, where A_s is the cross-sectional area of steel required per foot of width of slab; F is the coefficient of subgrade friction, which is taken as 1.5 for highway pavements; L is the length of the slab between the free ends (40 to 100 ft); w is the weight of the slab per sq ft (12.5 lb per sq ft per in. of thickness); and f_s is the allowable working stress in the steel and considered to be ½ to ¾ of the minimum yield strength.

The area of steel in each direction, according to the "subgrade-drag formula", varies with slab dimensions. In addition, certain minimum sizes and maximum spacings have been established as a result of experience.

For state highway pavements, and also for pavements in industrial and commercial areas, the longitudinal wires should not be smaller than No. 2 gage (0.2625-in. dia), and the spacing should not exceed 6 in. For transverse wires, the minimum size should not be less than No. 4 gage (0.2253-in. dia) and the spacing should not be more than 12 in. The minimum sizes are indicated because of the high frequency of load applications while the maximum spacings provide the desired distribution of the steel in the slab.

General practice is to specify a longitudinal spacing of 6 in. and a transverse spacing of 12 in. and vary the sizes of the steel members with the length, width and thickness of the slab.

As an example, a slab 9 in. thick, 12 ft wide and 40 ft long will call for No. 2 gage longitudinal wires at 6-in. centers and No. 4 gage transverse wires spaced 12 in. apart. For a slab 80 ft long the longitudinal wires will be No. 0 gage (0.3065-in. dia) while the spacings of the wires and the size of the transverse wires will be the same as for the 40-ft slab. Similarly, No. 00 gage (0.3310-in. dia) longitudinal wires on 6-in. centers are used in slabs 100 ft long.

Stronger joint design is an important trend in concrete pavement construction. Steel dowels ¾ in. and 1 in. in dia were formerly in common use. Although slab thicknesses were increased to meet the requirements of traffic in the past, no changes were made in the sizes of dowels that transfer the loads across the

HOW TO RUB or GRIND CONCRETE

Today, more and more builders specify a fine finish for concrete walls and ceilings. Because of this new requirement, and of the time and expense involved for hand finishing large areas, Stow Manufacturing Company has developed two, easily portable flexible shaft grinders for finishing concrete. These grinders are electrically powered.

Two methods are used to smooth off hardened concrete: wet rubbing and dry grinding. Wet rubbing—required for smoothing green concrete to a plaster-like finish. Use slow speed grinding wheel or disc. Apply water while grinding. Wet concrete can also be painted on with a brush, then smoothed into holes with a grinding wheel. Dry Grinding—use a high speed grinding wheel or abrasive disc to smooth dry concrete.

Either of Stow's portable electric grinders, the ½ HP model G40-C or the ¾ HP model JT-50, can be used for wet or dry grinding. Both models are available with open or totally enclosed motors, and are equipped with 8 or 12-ft. flexible shafts. Angle heads with different speed ratios can be selected. Write for STOW's pamphlet, Grinding Concrete, for complete information on proper speeds, grinding discs and wheels for both wet and dry concrete finishing. Stow Manufacturing Co., Binghamton, N. Y., also makes a complete line of concrete vibrators, rotary trowels, and screeds.

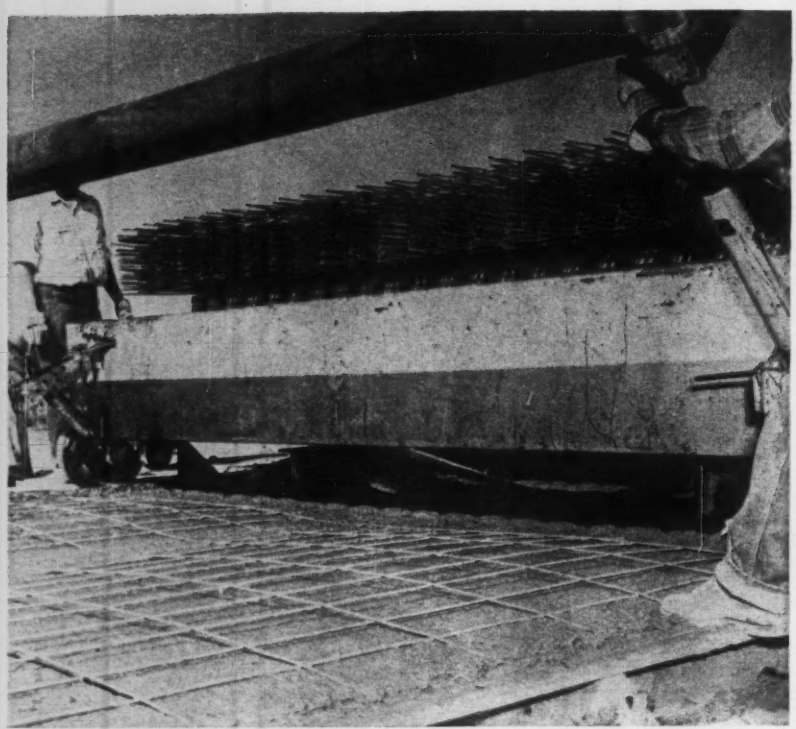
STOW MANUFACTURING CO. Dept. A-1
19 Shear St., Binghamton, N. Y.

Please send me your pamphlet, GRINDING CONCRETE.

Name..... Title.....

Company .....

City..... Zone.... State.....



CONTRACTOR DEVELOPED MACHINE in Oregon for vibrating wire fabric into place; slab is placed in one lift, 8 in. thick.

joints. The spacings of dowels varied from about 11 to 15 in.

As a result of research by the Bureau of Public Roads, it was concluded that the diameters of steel dowels spaced 12 in. apart should be on the order of ⅛ in. for each 1 in. of slab thickness. Accordingly, more states are specifying a minimum dowel diameter of 1 in. for an 8-in. slab and 1¼ in. for 9- and 10-in. slabs—all at 12-in. spacing.

There is a trend towards mechanization of the handling and placing of reinforcing steel. It has been a practice to distribute the steel along the shoulder of the road and rehandle the sheets for placement on the struck-off concrete. Now it is quite common to stack the sheets on a trailer alongside the forms; handling is directly from the trailer to the concrete between the forms.

Another type of trailer that has come into use during the past two years consists of a heavy duty double platform mounted on flanged wheels that ride on the forms and towed by the concrete spreader. The trailer, loaded with sufficient steel for about 2,000 ft of pavement, moves along as the concrete is struck off by the spreader at the proper level. The sheets of steel are pulled off the top of the stack by one or two men and dropped into position.

Besides eliminating excessive handling of reinforcing steel and thus producing a saving in labor, use of the platform also results in cleaner steel and fewer obstructions to men and equipment operating in the area.

An ingenious contractor developed a machine in 1959 for installing sheets of welded wire fabric without the necessity of placing the concrete in two lifts. It forces the fabric into the concrete that has been struck off level with the top of the forms. The machine consists of a heavy structural steel frame 20 ft long, supported on flanged wheels which run on the side forms. The top cross-bracing serves as a platform to carry a large supply of welded wire fabric. Underneath and inside the main frame is a suspended frame consisting of side angles parallel to the forms and transverse angles at 2-ft centers extending between the side angles.

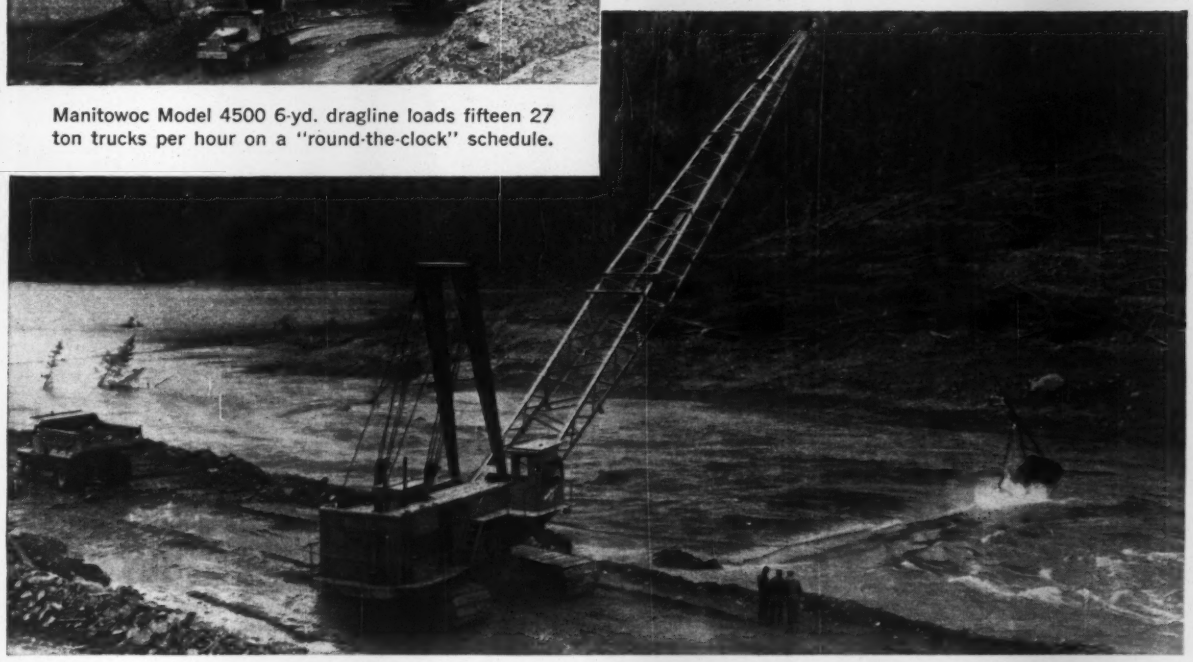
Hydraulic jacks and heavy duty vibrators push the sheets of fabric down to the depth specified in the plans. Depth measurements and cores drilled from the pavement show that the steel is accurately placed and that there are no mortar planes where the wires have been pushed down or where the angles have penetrated the concrete.

The improvements in design and construction that have developed over the years may be considered the forerunners of even greater improvements in the future. The combination of better design and better construction will provide longer lasting and smoother riding pavements as well as keep construction and maintenance costs to a minimum.

Manitowoc Model 4500 6-yd. dragline loads fifteen 27 ton trucks per hour on a "round-the-clock" schedule.

Flood threat created by earthquake is tamed with

MANITOWOC dragline



When the violent earthquake of last August hit near Ennis, Montana, the Madison River between Ennis and Hebgen dam was blocked by a 43 million cubic yard landslide. Plugged by tons of dirt and rocks, the river immediately backed up to form a lake over five miles long and up to 200 feet deep. Quake lake — as it is known by local residents — overflowed shortly after the earthquake, creating a dangerous flood threat to downstream communities.

At this point the U. S. Army Corps of Engineers bulldozed a 200 foot wide spillway along the length of the slide . . . a plan not entirely successful because of erosion at the lower end of the spillway.

A 6-yd. Manitowoc dragline owned by the F&S Contracting Company of Butte worked 'round the clock cutting down the spillway to lower the lake level. The Manitowoc loaded fifteen 27 ton trucks an hour. The spillway channel was deepened at the rate of .7 ft. each 12-hour shift. Early fears of flood danger were removed as the level of Quake lake was lowered by over 50 feet and shortened from seven miles to four.

Your Manitowoc distributor has full information on the Manitowoc dragline described here. Though your job problems may not be of earthquake size, he can analyze your operation and suggest the Manitowoc machine most profitable for you.

Manitowoc

MANITOWOC ENGINEERING CORP.

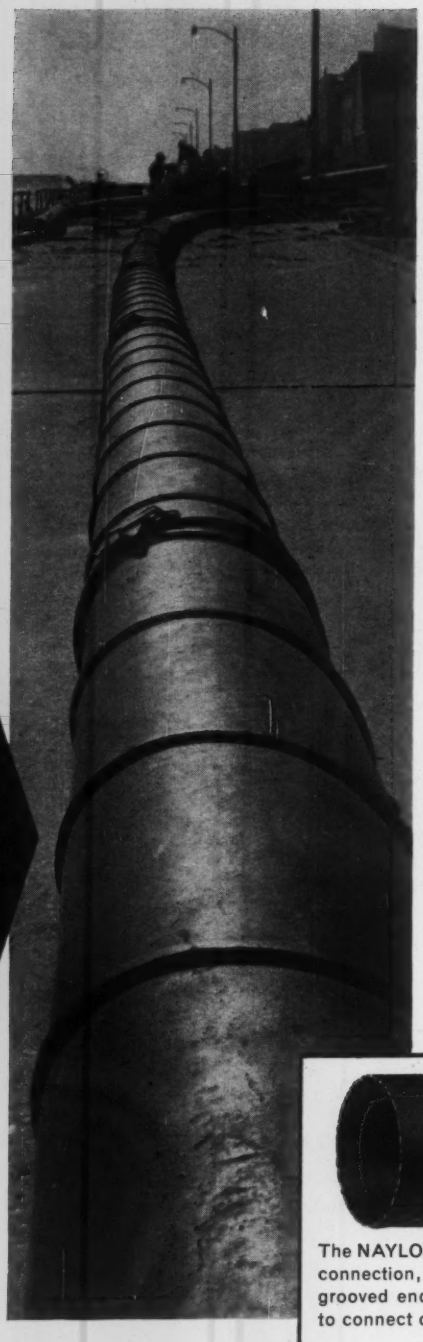
(A Subsidiary of The Manitowoc Company, Inc.)

Manitowoc, Wisconsin

SHOVELS	CRANES	DRAGLINES	TRENCH HOES
1¼ — 6 YDS.	25 — 125 TONS	1¼ — 6 YDS.	1¼ — 3 YDS.

SHORT CUT TO LONG LINES

Use This **NAYLOR** *Combination to Speed Pipe Line Installations*



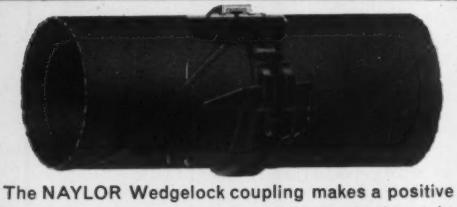
You save work and speed the job when you team up NAYLOR Spiralweld pipe and Wedgelock couplings for air, water, or ventilating lines.

The light weight of NAYLOR pipe makes it easy to install whether you suspend it, support it, string it along the surface, or bury it.

You get further short cuts by making connections with the NAYLOR Wedgelock coupling which is designed for faster, easier and more economical installation.

For long lines or short lines, you'll be time and money ahead to specify this NAYLOR combination. Diameters from 4″ to 30″ and thicknesses from 14 gauge to 8 gauge.

Write for Bulletin No. 59



The NAYLOR Wedgelock coupling makes a positive connection, securely anchored in standard weight grooved ends. A hammer is the only tool needed to connect or disconnect it.

NAYLOR PIPE *Company*

1248 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

When Hong Kong's reservoirs look like this . . .

Even 'Red' Water Is Gold

The British Crown Colony of Hong Kong, now experiencing its worst drought in 10 years, is negotiating with Communist China for water.

Too much water is an annual calamity during the monsoon season—May through August—when as much as 85 in. of torrential rains create disastrous floods and rock slides.

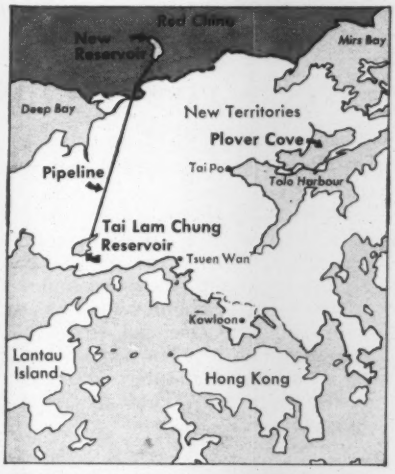
But in the winter months, because of riverless Hong Kong's inadequate water storage facilities, the city's burgeoning population (increasing 130,000 a year) is allowed to use water only four hours a day.

The talks, started last month, stemmed from Red China's offer to provide water from a 9-billion gallon reservoir just completed in nearby Kwangtung Province.

Besides the obvious embarrassment, acceptance of this offer presents a rather ticklish political poser. It is generally accepted that Peiping, while boasting of rapid completion of the reservoir project, used a conscripted labor force of as many as 27,000 workers. China's forced labor policy has been condemned by London.

The Red Chinese water, offered to Hong Kong on a cash-and-carry basis (the Colony to build the transmission line), would be piped 12 miles to the existing Tai Lam Chung reservoir from the new lake, five miles over the border.

The Chinese storage facility, located in the Shum Chun River Valley, is said to consist of a series of compacted earth dams, 96 ft high, with a combined length of 3,750 ft. As well as generating 320 kw of power, the project will irrigate 2,000 acres via a 25-mile-long reinforced concrete tunnel. It will still have enough water left to supply Hong Kong's three million people for seven months, according to Peiping.



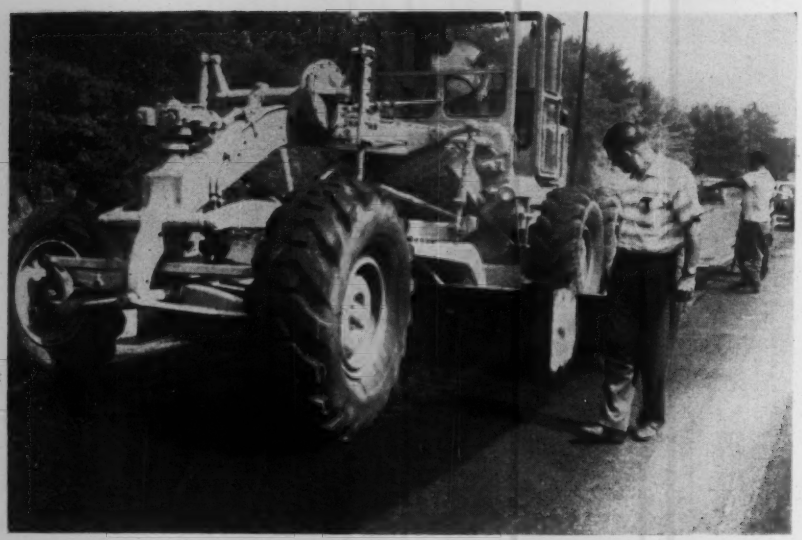
HYDROPOLITICAL PROBLEM lies in offer by Red China to furnish water to the British colony of Hong Kong.

Seen by the British as anything from a propaganda gimmick to a neighborly good-will gesture, the Reds' offer could backfire if the rapidly built earthfill does not withstand this year's monsoon rains. Peiping's claim of a 9-billion gallon capacity is also doubted.

Nevertheless, Hong Kong desperately needs the water. The Colony's governor, Sir Robert Black, has confirmed that the city is planning to construct the necessary pipeline.

Further emphasizing the dire straits of the Colony, the government is officially investigating a plan to build a fresh water lake in Plover Cove, a tidal estuary of Tolo Harbor.

The proposed "lake in the sea" would have a capacity of 29 billion gallons and cost $60 million to build. Three rain catchment areas would drain 55 million gallons into the lake and dilute the sea water, making it potable.



SIMPLE SPREADING EQUIPMENT is all you need. Here, a motor grader at work on New Hampshire's Londonderry Turnpike. Note blade wing attachments.

PREFERRED METHOD of spreading is with conventional bituminous paver. Mixture cures rapidly, requiring one-way traffic only for brief periods during resurfacing.

New Resurfacing Mix Proves Out

A new method of resurfacing, trial-tested a year ago on 65 miles of major highways in New Hampshire, has proved so satisfactory that 200 more miles of the state's main arteries will be rejuvenated this spring and summer at a cost of $1,000,000.

The method, called Dix-Seal, was developed and patented by Howard Dickinson, erstwhile maintenance engineer of the Connecticut Highway Department.

It consists of a plant mixture of a closely graded sand and a medium curing liquid asphalt.

Materials are combined in a hot-mix asphalt plant at high temperatures. The resultant mixture is spread in a thin layer, from ½ to ⅝ in. thick. The New Hampshire Department of Public Works and Highways has spread Dix-Seal with road graders, truck-drawn spreader boxes and regular pavers. Pavers are now used exclusively.

The aggregate, with maximum size under ⅜ in., is a combination of coarse and fine sand, blended to meet the same grading requirements as the sand portion of a hot-mix asphaltic concrete pavement. The use of sand aggregate permits spreading of the mixture in very thin layers so that city streets can be resurfaced a number of times before curbs are buried. Quantities of mix per mile are low about 500 tons for a roadway width of 24 ft.

Highway Department specifications call for this aggregate grading:

Sieve Size	% Passing, by Weight
No. 4	85-100
10	65-85
20	40-60
40	20-40
80	8-20
200	3-6

Bituminous material is 6.5-7.5% by weight of total mix.

MC-5 cutback asphalt, the binding agent, is produced in the refinery by mixing about 12-14% kerosene with a rather soft asphalt cement with penetration of about 150. The result is a viscous liquid, flowing at room temperature and not nearly so hard as regular paving asphalt.

Success of the Dix-Seal process lies in the elevated temperature of the mix, between 300° and 340°F. At 300°F some of the kerosene is driven off, but much of it, trapped in the mass of sand, remains and makes the mix extremely workable for application. As soon as it is spread on the highway in a thin layer, the hot kerosene vapors in the upper part of the mix dissipate and a substantially hard crust of asphaltic concrete forms on the surface.

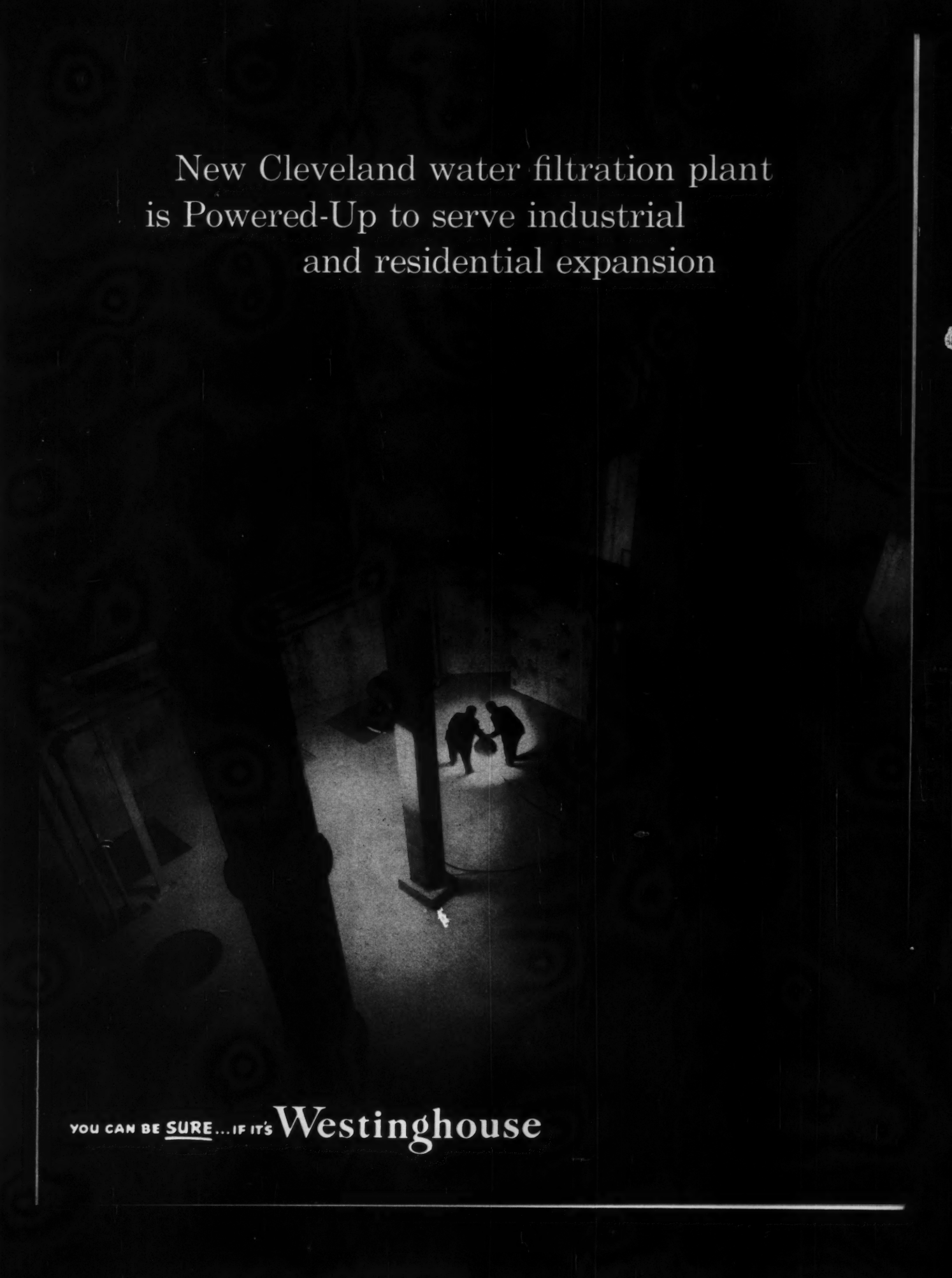
The kerosene trapped in the bottom keeps the lower half of the layer in a pliable condition. This, plus the high heat of the mix, softens the underlying old pavement and creates a tight adhesive bond between the two. It is anticipated that Dix-Seal's low layer pliability will continue several years, healing cracks formed by winter's frost-heaving action, while the top surface hardens and toughens to resist abrasion of heavy traffic. Newly applied Dix-Seal is extremely black and shiny, but the thin surface layer of asphalt wears away leaving a perfect sand-paper finish with good skid-resistant characteristics.

John O. Morton, New Hampshire's Public Works Commissioner, says that the approximate $5,000 per mile cost is the same as the peastone armor-coating the state has used widely in recent years. But Dix-Seal gives a quieter riding surface, is skid-resistant; eliminates more dips; and produces a far smoother traveling surface.

The new mix has a higher protective quality than peastone, preventing water from reaching the base and sub-base materials. Mr. Morton declares that although weather has a critical effect on applying seal-coats, it has only a minor effect on Dix-Seal application.

During armor-coat construction, the motorist must pass over a surface of sticky asphalt and, frequently, loose stone chips. Loose chips may be scattered over a wide area. Because the mixture sets up quickly, this is not a factor with Dix-Seal.

New Cleveland water filtration plant
is Powered-Up to serve industrial
and residential expansion

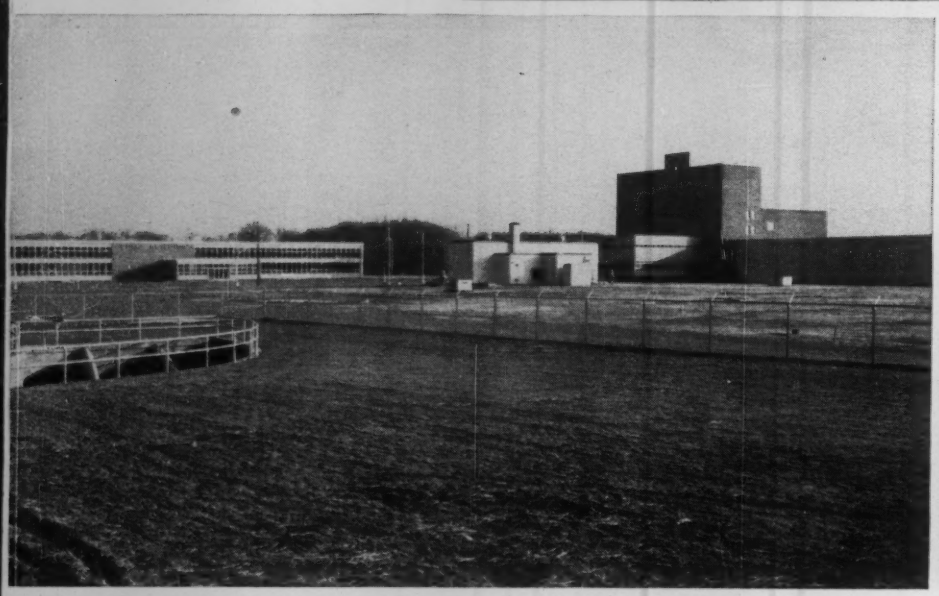


YOU CAN BE SURE... IF IT'S Westinghouse

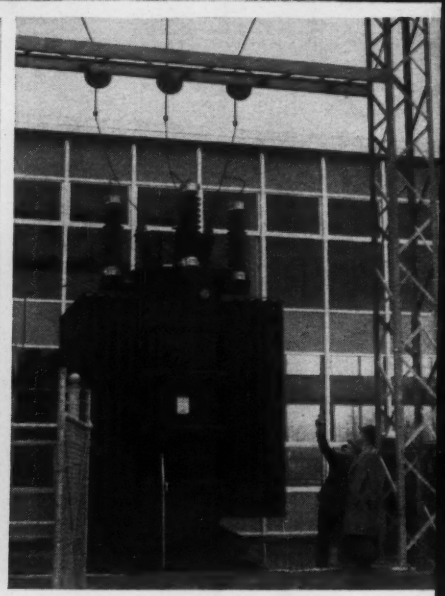
Cover photo:
View of raw water pump suction wells illuminated by Westinghouse VEK-16 floodlighting.

Project group discussing layout of Crown Filtration Plant includes J. E. Hrovat, Vice President of Engineering, Doan Electric Co., Electrical Contractors; E. E. Croushore, Westinghouse Construction Sales Engineer; L. O. Meyer, Branch Sales Manager, WESCO, Cleveland; Dan Kasych, Chief Engineman, Pump Building; G. L. Baughman, Chief Electrical Engineer, Havens and Emerson, Consulting Engineers; S. C. Simmermacher, Chief Mechanical Engineer, City of Cleveland; M. B. Trimble, Westinghouse Construction Sales Engineer; E. S. Goulder, President, Doan Electric Co.; and H. M. Stafford, Salesman, WESCO, Cleveland.

J-94123-2



Over-all view of Crown Filtration Plant, Cleveland, Ohio. Pump building is at left and the filter building at right. Westinghouse OV-20 street lighting was provided for plant entrances and roadways.



Dan Kasych and E. E. Croushore examine one of the two Westinghouse 5000-kva power transformers which step incoming 34.5-kv service down to 4160 v for main pump drives.

Westinghouse system provides for 100% electrical load increase in new water pumping station

The new Crown Filtration Plant was designed to meet the growing need for water supply in the westerly suburbs of Cleveland, Ohio, and, as an important part of that planned expansion, the Westinghouse electrical system presently installed provides for 100% load increase without adding to the system.

The pumping station-filtration plant is located on a 55-acre site and is the newest addition to the city's expanding water supply system. Construction was started in 1953 and completed in 1958, and represents nearly a $20,000,000 investment. Present plant capacity is 50 mgd; but, because of anticipated future requirements, the plant has space and provision for additional equipment to provide capacity of 100 mgd.

Raw water is obtained through a crib 2½ miles offshore in Lake Erie. The water from the crib is carried through a connecting tunnel to a raw water well, where its handling is taken over by submerged raw water pumps. Treatment and flow of the water from this point through the filtration plant are automatic and exactly controlled, leading finally to a 15-million-gallon filtered water reservoir located in the southwest corner of the plant area. Six service pumps deliver the water from the reservoir to both the low service zone and the first high service zone supplied by the Crown plant.

The major electrical elements supplied by Westinghouse to Power-Up this filtration operation include:

Two 5000-kva power transformers—to step utility service from 34.5 down to 4.16 kv.

Main metal-clad switchgear—to control and distribute power to motor starters (for L.S.) and provide for starting of H.S. motors (1750 hp).

Dry-type power center—to provide 480-v service to plant auxiliaries.

Westinghouse lighting throughout the plant area, including fluorescent, incandescent, street lighting and floodlighting.

In addition, Westinghouse supplied the many panelboards required in the plant's operation.

The planned Powering-Up of the Crown Filtration Plant means it can meet all foreseeable future requirements with a minimum of modification. Additional water handling and treating facilities can be installed in areas already provided for them. And all such additional equipment can be operated without adding to the existing electrical distribution system.

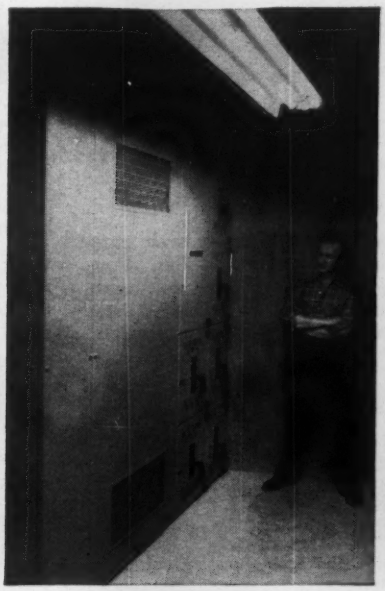
Cleveland now has surplus water capacity in its plants, and is in an enviable position with an almost unlimited supply of good Lake Erie water. It is ready and willing to construct additional facilities to process and deliver this water whenever the need for a greater supply for new industry is indicated.

(contd.)

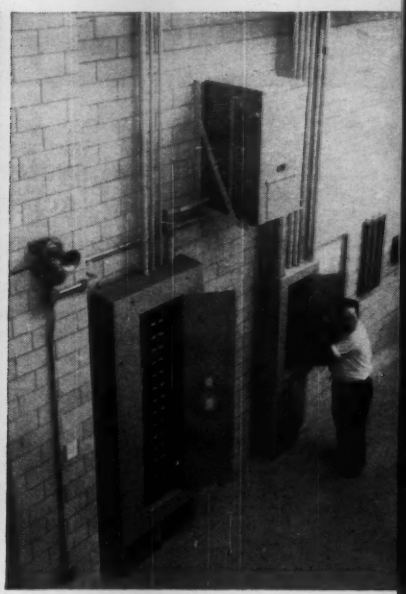
YOU CAN BE SURE...IF IT'S Westinghouse

J-94123-3

View in main switchgear room with G. L. Baughman, M. B. Trimble and S. C. Simmermacher examining Westinghouse metal-clad switchgear. Lineup at right contains main incoming line breakers, bus tie breaker, reactor starters for high service pump motors, and feeder breakers for power center and low service pump motor starters. Five-kv bus duct overhead provides connections from metal-clad switchgear to Ampgard* high-voltage fused starters at left. *Trade-Mark



Dan Kasych inspects switchgear room. Westinghouse 225-kva power center utilizes dry-type transformers and DB low-voltage air circuit breakers to supply power panels throughout pump building. Room lighting is Westinghouse 2 SPC-75 slimline fluorescent luminaires.



Westinghouse CDP power distribution panelboard and wall-mounted 37.5-kva dry-type transformer feeding NLAB lighting panelboard. J-94123-3

Section of main pump floor showing the three 25-mgd first high service pumps and three 8-mgd low service pumps which are presently installed. Metal-clad switchgear cubicles and Ampgard high-voltage starters for these and two additional future pumps of each rating are installed in the main switchgear room. High bay mercury-vapor lighting is provided by Westinghouse Millite® luminaires.

View in filter building showing row of clarified water filter beds. Under average flow conditions, the 12 filters in the plant will pass a total of 50 mgd. Lighting is supplied by Westinghouse VEK-16 floodlights.

(contd.)

Electrical system provides for 100% load increase

Powering-Up electrically for future growth can mean important benefits and savings for you. For further information, call the Westinghouse electrical construction engineer nearest you, or write: Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pennsylvania. J-94123-4

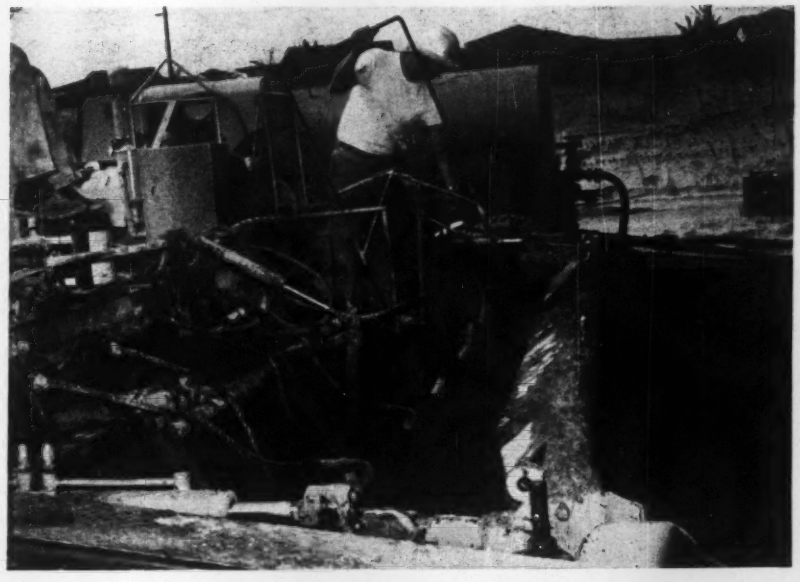
OWNER: City of Cleveland, Ohio
CONSULTING ENGINEER: Havens and Emerson, Cleveland, Ohio
CONSULTING ARCHITECT: Small-Smith-Reeb and Draz, Cleveland, Ohio
GENERAL CONTRACTOR: The Hunkin-Conkey Construction Co., Cleveland, Ohio
ELECTRICAL CONTRACTOR: Doan Electric Co., Cleveland, Ohio
WESTINGHOUSE DISTRIBUTOR: Westinghouse Electric Supply Co., Cleveland, Ohio

Over 250 Pages Westinghouse Data in Sweet's Construction File.

YOU CAN BE SURE...IF IT'S

Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV ALTERNATE FRIDAYS



Paver Has Internal Vibrators

A battery of 10 high frequency internal vibrators was mounted on a Rex slipform paver for use on a California highway job.

Purpose was to make sure the rig would produce pavement that meets tight density requirements imposed by the California highway department. The vibrators replace the surface type vibrating pan previously used.

The machine is the second paver of its type used in California where smoothness specifications are rigid (ENR Jan. 14, p. 38). It is in use on an $8-million, 4.9-mile, eight-lane Harbor Freeway contract in Los Angeles held by a joint venture of Ukropina, Polich & Kral and J. E. Haddock, Ltd. With two dual drum mixers feeding concrete, the slipform paver is placing in an eight-hour day some 3,000 ft of 9-in.-thick, 24-ft-wide pavement.

Insulated Forms Aid Concrete

Insulating form panels permitted wintertime placing and curing of concrete in the Corps of Engineers' Lock 41 on the Ohio River at Louisville, Ky.

The system consisted of panel forms using an insulating layer of inert fireproof material on plywood, with a sponge rubber perimeter seal.

The concrete was cast in structural steel forms held in place by vertical steel "strongbacks" anchored to previously cast concrete. The steel forms also supported the movable insulating panels.

The insulating panels were made of ¼-in. plywood, framed with 1⅜-in. square wood nailing strips. Sponge rubber strips 1¼ in. wide by ¾ in. thick were fastened to the nailing strips with roofing nails, forming a perimeter seal. The interior surface of the plywood, between the nailing strips, was covered with the 1½-in.-thick inert fireproof material.

These panels were then attached to the bottom edge of the steel forms with cut-outs provided to allow contact with the concrete surface immediately below the forms for the "feet," or lower contact portion, of the cantilever strongbacks.

After positioning, these lower insulating panels were snugged to the concrete by form bolts in the concrete. Sponge rubber acting as a perimeter gasket. This sealed the covered concrete, retaining residual moisture for curing and providing a dead air layer for insulation.

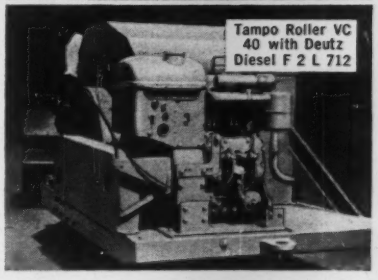
The next step was to insulate the steel forms for the next concrete placement. They were covered with insulating panels made of the 1¼ in. of inert material placed between two layers of ¼-in. plywood separated by 1⅜-in.-square nailing strips around the edges of the panel. The finished insulating panels were bolted to the steel forms and became part of the movable unit.

The top surfaces of concrete were protected by identical insulating panels supported by lightweight trusses fabricated on the job.

The Hardaway Contracting Co., Columbus, Ga., is the contractor.

DEUTZ AIR-COOLED DIESELS GIVE YOU MORE COMPACTION —LESS DOWNTIME

BROS Vibra-Pactor VP 9D with Deutz Diesel A 2 L 514



Tampo Roller VC 40 with Deutz Diesel F 2 L 712

Fewer passes—You can level a site (any soil) to 100% density faster, at less cost with a DEUTZ-powered vibratory roller. 8 million yards of sand were compacted at Griffiss Air Force base with DEUTZ-powered Vibro-Plus rollers... at great savings.

Less downtime—Deutz Air-cooled Diesels because of their rugged construction aircooling and compact design, eliminate the problems usually associated with water-cooling systems.

You can get these benefits—if you don't have a DEUTZ equipped roller, a DEUTZ power-pack is available.

DEUTZ Diesels do other tough jobs—on graders, earthmovers, shovels, concrete mixers, compressors and generator sets. Air-cooled DEUTZ diesels stand up under heat up to 140° Fahrenheit, arctic cold, tropical humidity. AIR-COOLED DEUTZ DIESELS range from 5 to 250 HP in 1, 2, 3, 4, 6, 8, and 12 cylinder models.

DEUTZ

Diesel Energy Corporation
82 Beaver St.,
New York 5, N. Y.

Please send facts on further advantages of Air-cooled DEUTZ Diesels for:

☐ Industrial uses ☐ Construction

I am ☐ Operator ☐ Dealer

Name .....

Address .....

City .....Zone .....State .....

You just can't beat it for strength and durability

Though it's so light that two men can easily handle a 14-ft length, pipe made of corrugated, galvanized Beth-Cu-Loy sheets is as tough and strong and long-lasting as any modern project will require. With Beth-Cu-Loy pipe, you get the strength of steel, the flexibility of steel, and steel's easy-to-handle light weight.

You also get the corrosion-resistance of steel which has been alloyed with just the right amount of copper, then coated with a heavy layer of prime Western zinc. The records show plenty of corrugated metal pipe installations which have lasted for 30, 40, even 50 years.

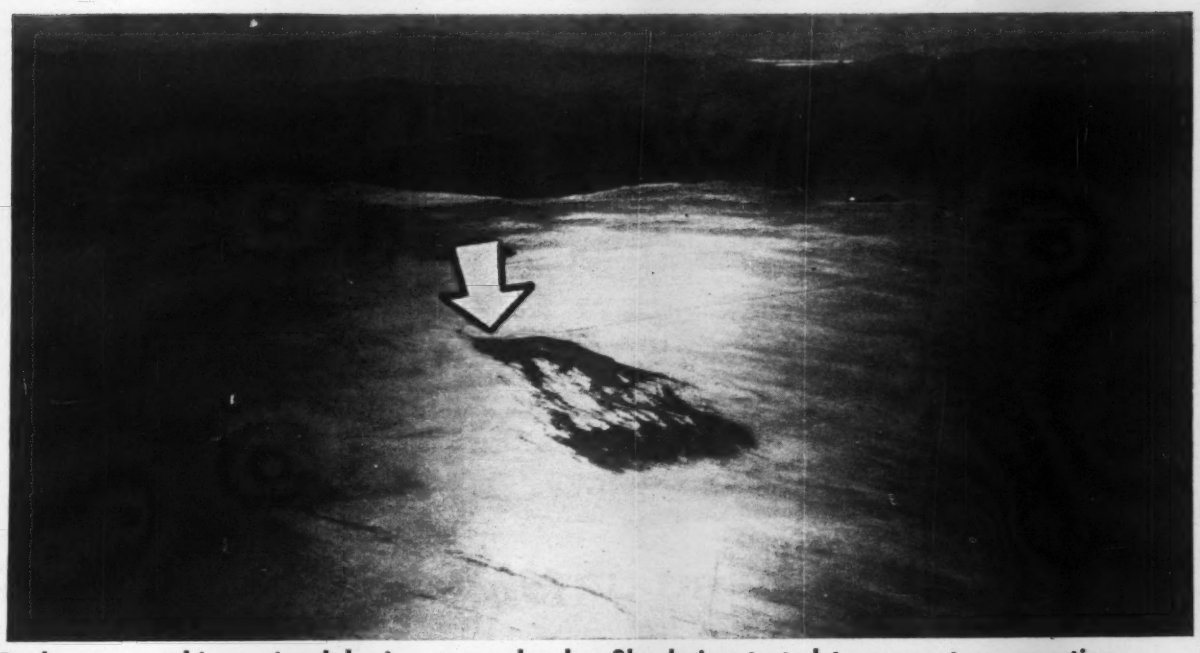
Because of its long lengths, Beth-Cu-Loy corrugated culvert pipe reduces the number of field joints, speeds up the laying. Large crews and heavy lifting equipment are unnecessary. The longitudinal flexibility of Beth-Cu-Loy pipe simplifies grading and alignment; transverse flexibility helps to distribute the loads peripherally.

Bethlehem manufactures only the Beth-Cu-Loy steel *sheets*—your fabricator will form them into pipe to meet your project's requirements. If you would like further details about Beth-Cu-Loy sheets or the pipe made from them, consult your local fabricator, or write to us at the address below.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



Dark area on shimmering lake is monomolecular film being tested to prevent evaporation.

'Invisible Shield' Cuts Losses

Evaporation is the biggest thief of lake water known to man—and it's also the most difficult to control.

Each year it steals about 13 million acre-ft of water from large lakes and reservoirs in the 17 western states. This is more than one-third the capacity of Lake Mead behind Hoover Dam.

How to reduce evaporation from large inland bodies of open water has been under study both in the laboratory and in the field by a number of engineers and scientists for several years. And considerable progress has been made.

Encouraged by lab experiments and small-scale field tests during the past eight years, the Bureau of Reclamation will conduct full-scale evaporation-reduction tests this summer. The tests will be made at Lake Sahuaro, a 69,800 acre-ft reservoir formed by Stewart Mountain Dam on the Salt River in Arizona.

Preliminary tests were carried out last fall at Lake Sahuaro and at Boulder Basin, an arm of Lake Mead. They indicated that a significant coverage of a monomolecular layer (monolayer) to reduce reservoir evaporation could be maintained for long periods of time.

The preliminary investigations were made to study the effect of geography and climate—particularly wind—upon movement and persistence of a monolayer. They also provided information on the development of improved methods of applications and maintenance of the monolayer.

• **Losses are tremendous**—The field investigations at Lake Sahuaro will be part of a Bureau research program started in 1952 on films for reducing reservoir evaporation. The importance of the research is indicated by the tremendous annual evaporation losses from our big lakes and rivers.

A comprehensive study by the U. S. Geological Survey in 1952 and 1953 indicated that the annual evaporation from Lake Mead alone was 875,000 acre-ft, equivalent to a depth of slightly more than 7 ft over the lake surface.

The materials that act as evaporation suppressors are among a broad class of polar compounds—substances whose molecules have a great affinity for water at one end. When these substances are in contact with water, each molecule tends to align itself with one end in the water and the other end projecting. Ideally this would form a film one molecule thick on the water surface. In any case, a thin layer of certain high-boiling-point, saturated, straight-chain alcohols on the water surface suppresses evaporation by preventing the escape of water molecules into the atmosphere.

Of the more than 200 compounds or combinations of polar compounds studied by the Bureau, to date the substance offering the most promise is a combination of cetyl alcohol (hexadecanol) and steryl alcohol (octadecanol). At its thinnest, the film is about six 10-millionths of an inch thick It is invisible and exhibits none of the interference patterns of color associated with thick multilayered, oil films.

During the Boulder Basin tests, the monolayer was applied over a relatively small area at the center of the basin. The location, size, movement, and other behavior of the film was observed during the following three or four days. The location of the application was chosen to assure the maximum time interval before the film washed ashore.

A typical application consisted of about 500 lb of the powdered alcohol preparation, sifted through a $\frac{3}{8}$-in. screen to retain large lumps. Small lumps were helpful; they aided in determining film location during calm periods and in locating beached films.

Immediately after treatment, a film would form and continue to increase in size under the influence of the wind and innate ability of the material to spread on a water surface. The film coverage, being a function of wind direction and speed, was at a minimum when the wind blew continuously in one direction for any extended length of time.

(*Story continues on p. 60*)

Another example of

3 TYPES
9 MODELS

No matter what your job may be—from small grading work such as land improvement, plant sites or secondary road construction to the big million yard-and-over projects—there's a Euclid scraper of the size and type that matches the job. Each one is ruggedly built for long life in heavy service . . . job proved for big productive capacity . . . and is years-ahead in engineering design with easy service accessibility that cuts downtime.

SIX-WHEELERS

12 yds. MODEL SS-12 . . . 17 yds. heaped . . . 227 h.p. . . . 5-speed transmission . . . 21.00 x 25 drive and scraper tires, with 24.00 x 25 optional.

18 yds. MODEL SS-18 . . . 25 yds. heaped . . . 320 or 336 h.p. . . . Torqmatic Drive or 10-speed standard transmission . . . 24.00 x 25 tires standard, 29.5 x 25 optional.

24 yds. MODEL SS-24 . . . 32 yds. heaped . . . 360 h.p. . . . Torqmatic Drive with converter lock-up . . . 27.00 x 33 tires are standard with 33.5 x 33 optional.

33 yds. MODEL SS-33 . . . 43 yds. heaped . . . 432 h.p. . . . Torqmatic Drive with converter lock-up . . . 33.5 x 33 tires on drive and 37.5 x 33 on scraper wheels.

Maximum stability for long, high-speed hauls . . . scraper bowls are interchangeable with bottom-dumps of 13, 17, and 30 cu. yd. struck capacities.

EUCLID Division of General Motors
Cleveland 17, Ohio

Plants in Cleveland and Hudson, Ohio and Lanarkshire, Scotland

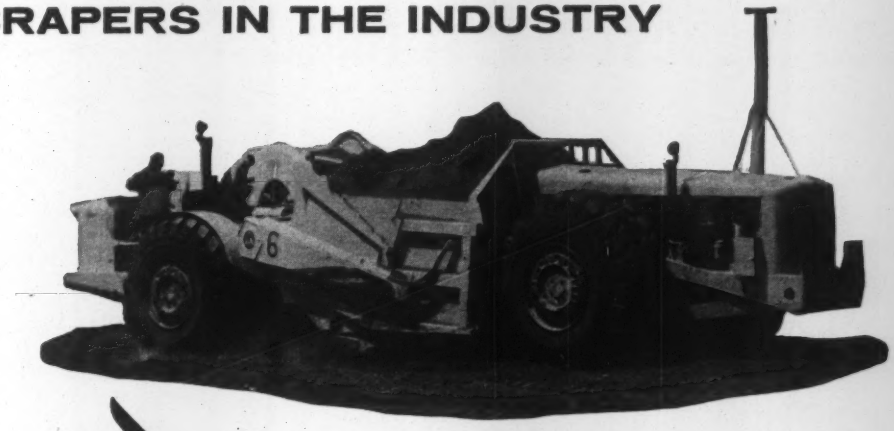
GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Euclid's Greater Dimension . . .

MOST MODERN AND COMPLETE LINE OF SCRAPERS IN THE INDUSTRY



ALL-WHEEL DRIVE "TWINS"

Twin-Power for big productive capacity and work-ability . . . a one-man earthmoving spread that can work more days and lengthen the working season.

14 yds. MODEL TS-14 . . . 20 yds. heaped . . . two engines with a total of 296 h.p. . . . separate Torqmatic Drive for each axle . . . 24.00 x 25 tires.

24 yds. MODEL TS-24 . . . 32 yds. heaped . . . total of 563 h.p. . . . separate Torqmatic Drives for each axle . . . tires are 27.00 x 33 standard with 33.5 x 33 optional.

OVERHUNG

Excellent maneuverability and ease of handling combined with power and speed that cuts cycle time.

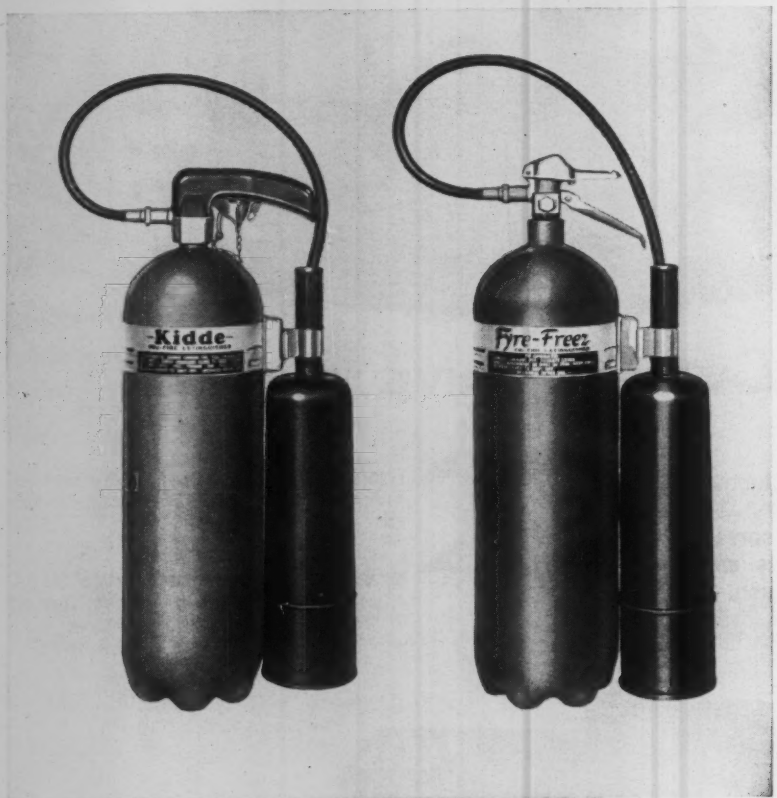
7 yds. MODEL S-7 . . . 9 yds. heaped . . . 148 h.p. . . . with Torqmatic Drive . . . full 90° hydraulic steering . . . 18.00 x 25 tires standard, 21.00 x 25 optional.

12 yds. MODEL S-12 . . . 17 yds. heaped . . . 227 h.p. . . . 5-speed transmission . . . full 90° hydraulic steering . . . 24.00 x 25 tires.

21 yds. MODEL S-18 . . . 30 yds. heaped . . . 336 h.p. . . . with Torqmatic Drive and converter lock-up . . . 27.00 x 33 tires standard, 33.5 x 33 optional.

Get all the facts and see how Euclid's Greater Dimension can bring a better return on your scraper investment.

New Kidde carbon dioxide portables awarded highest U.L. rating!



Belleville, N. J. — A spokesman for Walter Kidde & Company announced here today that four of the company's new portable fire extinguishers have been awarded the Underwriters' Laboratories highest ratings for their respective capacities. To those interested in fire safety, this means that, pound for pound, these new Kidde units have more fire-killing power than any other carbon dioxide extinguishers on the market today.

Available in 15 and 20 pound capacities, in either squeeze valve or trigger models, these power-packed Kidde units feature new hose and discharge horn assemblies, which are responsible for their extra fire fighting ability. The new assembly is supplied also with Kidde's 10 pound carbon dioxide portable which has a U. L. rating not exceeded by any other extinguisher of its capacity. This hose-horn combination is also being offered as a replacement unit for existing 10, 15 and 20 pound carbon dioxide units, and when attached will upgrade their effectiveness equal to the new ratings.

For more information on these top-rated Kidde carbon dioxide portables write Kidde today.

Kidde

Industrial and Marine Division
Walter Kidde & Company, Inc.
544 Main St., Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd.
Montreal — Toronto — Vancouver

The film would concentrate against the downwind shore but, after a change in the direction of the wind, would again expand and coverage would greatly increase.

The monolayers established on Boulder Basin were very persistent. At the conclusion of the tests, films from treatments made at least one week earlier were still present and contributing significantly to the coverage of the basin.

This persistence is attributed to several factors, among which are: the large size of Boulder Basin (about 35,000 acres); steep rock walls bounding a large portion of the basin; variable onshore-offshore wind patterns; and probable low attrition from bacteria.

At Lake Sahuaro the monolayer was established over an area about 300 to 400 yards in diameter. It was observed several times daily to determine its size, shape, and path of movement.

The alcohol was dispensed by dusting it onto the water surface from a boat. About 50 lb were applied during each treatment. It was applied daily when weather conditions permitted. Two different hexadecanol-octadecanol preparations were used in these tests.

The Lake Sahuaro studies presented conditions similar to those at Boulder Basin, except for the size of the reservoir and the strong influence of the surrounding land on the wind patterns.

Several factors, such as probable low bacterial attrition, steep rock walls around a major portion of the lake, and low-speed winds of variable direction helped to maintain the film.

Under similar conditions, a full-scale treatment of Lake Sahuaro could probably be accomplished with reasonably high percent coverage for long periods of time by use of strategically located shoreline dispensers.

• **Second big test**—The full-scale investigations to be undertaken at Lake Sahuaro this summer will be the second comprehensive hydrologic and economic evaluation to be performed by the Bureau at a reservoir. The first investigation was carried out on Lake Hefner at Oklahoma City in 1958.

The Bureau's research program in reducing evaporation losses from reservoirs includes studies being made of the surface temperature and wind conditions at several reservoirs in the western states in preparation for future additional field research.

Investigations are being performed also by the Robert A. Taft Sanitary Engineering Center of the U. S. Public Health Service. Negotiations for specialized laboratory and field investigations are also under way between several western colleges and the Bureau of Reclamation.

How to choose the right bonding company for every job

SERVICE: Choose a company which will give you fast, on-the-job service. Ætna Casualty has over 70 supervising offices in key cities—plus thousands of experienced agents from coast to coast.

EXPERIENCE: Choose a company with a trained staff of bonding specialists. Ætna Casualty employs hundreds of experts—men highly skilled in every phase of suretyship—whose knowledge and experience qualify them to handle your bonding needs on jobs of all kinds.

CAPACITY: Choose a company big enough and strong enough to handle any job—no matter how large or small. Ætna Casualty's qualifying limit, as set by the Federal Government, is one of the highest in the industry.

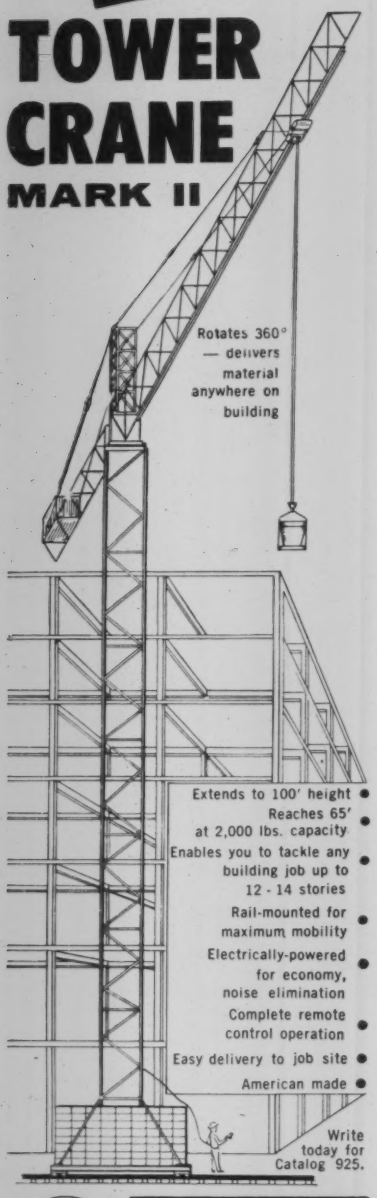
You get all three when you get . . .

ÆTNA CASUALTY

Quality BONDING Service for contractors in every field

Ætna Casualty and Surety Company • *Affiliated with* Ætna Life Insurance Company • Standard Fire Insurance Company • Hartford 15, Conn.

SHLAGROMATIC
New
TOWER CRANE
MARK II


Rotates 360° — delivers material anywhere on building
Extends to 100' height
Reaches 65' at 2,000 lbs. capacity
Enables you to tackle any building job up to 12 - 14 stories
Rail-mounted for maximum mobility
Electrically-powered for economy, noise elimination
Complete remote control operation
Easy delivery to job site
American made
Write today for Catalog 925.

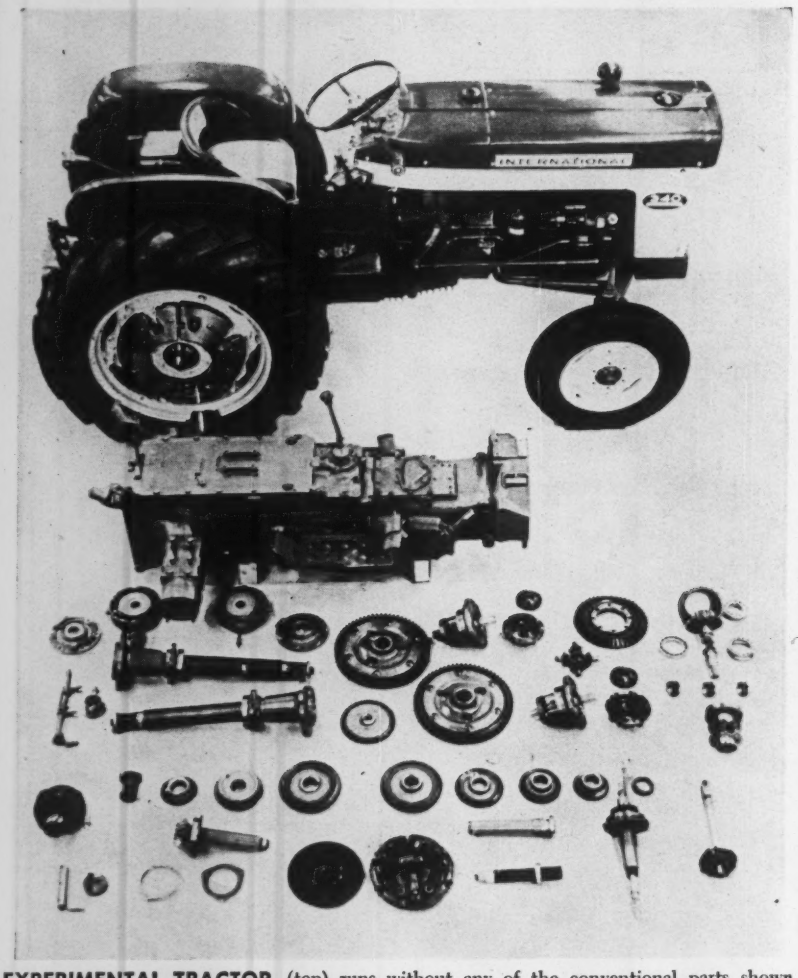
another PRODUCT by the PIONEERS of SQUARE columns!
SHLAGRO
STEEL PRODUCTS CORPORATION
SOMERVILLE, MASS

☐ Please send me the Shlagromatic Tower Crane catalog.

name_____

title_____

Please attach to your professional letterhead and mail to:
SHLAGRO STEEL PRODUCTS CORP.
SOMERVILLE, MASS. EN-5



EXPERIMENTAL TRACTOR (top) runs without any of the conventional parts shown below. Eliminated: gear case, gears, clutch, differential, axles, and brakes.

Test Tractor Has No Gears

A gasoline powered tractor that uses hydraulically driven reciprocating engines and runs without any solid mechanical linkage between the gas engine and the wheels has been developed and is being tested by International Harvester Co.

The machine, operable but still in an early experimental stage, has no gear transmission, driveshaft, differential or axles. Nor has it an independent braking system.

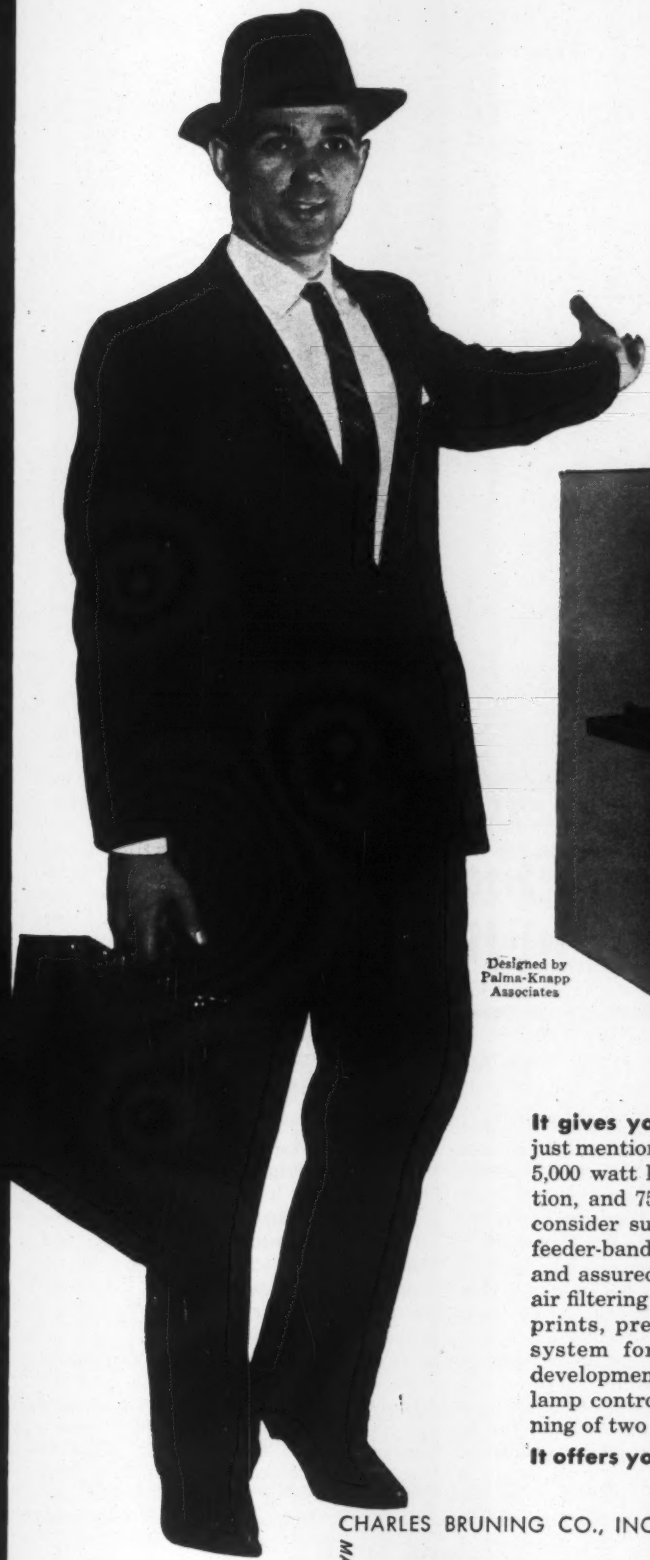
Replacing all the conventional power train components and braking mechanisms are three main elements; a piston pump, a high pressure hydraulic piping system, and a pair of oil operated, radial piston engines.

Here's how the drive works: A multiple-piston pump is attached directly to the rear of the tractor engine. Nine pump plungers extend rearward to contact a variable pitch swash plate which is connected directly to the engine by a shaft running through the center of the pump. As the swash plate revolves on the oblique it cams the pump plungers inward to give them the reciprocating motion that forces oil through the system. Because the swash plate pivots about its center, the inward motion of one piston is accompanied by a corresponding outward movement of opposing pistons. Thus a constant pressure is maintained with the system.

The oil is circulated through a high pressure piping system to a five-cylinder radial hydraulic motor mounted on each rear wheel. These motors resemble, and work like, radial airplane engines except that hydraulic pressure rather than expanding gas moves their pistons. The pistons are connected to an eccentric

(*Turn the page*)

Now the Bruning Man brings you the Whiteprinter that GIVES YOU THE MOST ...THEN OFFERS MORE!



Designed by Palma-Knapp Associates

It's Bruning's Great New Versatile Model 600!

It gives you the most! And we'll just mention the 42" printing width, 5,000 watt lamp, automatic separation, and 75 fpm speed range. But consider such built-in extras as: a feeder-band system for extra speed and assured print protection, dual air filtering for cleaner and sharper prints, pressure-roller developer system for instant and positive development at all times, split-shade lamp control for simultaneous running of two different materials.

It offers you more! Now take your choice, to suit your needs and budget, of these options: a 7,500-5,000 watt lamp with selector switch, a 4-way tracing tray, an automatic level-keeping developer pump, a deluxe feedboard unit complete with vacuum ports, swing-out rods for roll stock, non-sag paper cutter, drawer, and even an ash tray.

If you can't beat it, why not join the "600." It's especially easy with Bruning's Lease-Purchase plan. Just call your nearby Bruning Man, or mail the coupon for a prompt reply.

CHARLES BRUNING CO., INC., DEPT. 5-U • 1800 CENTRAL RD., MT. PROSPECT, ILLINOIS

MAIL COUPON TODAY

BRUNING Copyflex®

Name_____ Title_____

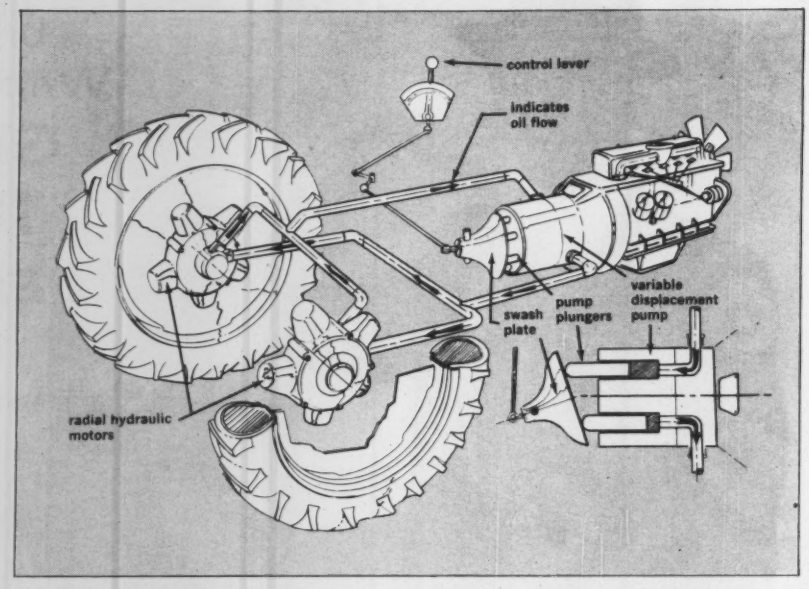
Company_____

Address_____

City_____ County_____ State_____

MAIL COUPON TODAY

OFFICES IN PRINCIPAL U.S. CITIES • IN CANADA: 103 CHURCH ST., TORONTO 1, ONTARIO



HYDRAULICALLY DRIVEN reciprocating engines mounted on rear wheels are run by a flow of oil from a piston pump attached to the gasoline engine.

which serves as a crankshaft to turn the wheels.

Because of the relative incompressibility of the oil and because of the use of pistons both in the pump and the wheel motors, tractor movement is not subject to the slippages found in units with torque convertors or automatic hydraulic clutches.

Wheel motor speed is controlled by a single lever that varies the angle at which the swash plate revolves. The greater the angle, the longer the pump piston stroke and the faster the tractor speed. A reduction in the swash plate angle reduces speed. When the control lever is so adjusted that the swash plate is at 90 deg to its shaft, the plate revolves without applying any camming action to the pump plungers, and the tractor is braked.

Because each of the wheels is turned by its own motor, it is possible to achieve great maneuverability by shutting off the oil flow to one motor. This not only brakes one wheel but diverts all the oil flow to the other.

One other important factor in the increased maneuverability of the experimental tractor is the absence of a gear case. As can be seen in the picture on p. 62, the gear case of a conventional tractor is almost as long as the engine of the test model. Elimination of this case makes it possible to greatly shorten tractor wheel base, and therefore to shorten the vehicle's turning radius.

To reverse the direction of the tractor travel, it is necessary only to move the control lever past the neutral or braking point. This reverses the flow of oil and immediately reverses the wheel motors.

One of the great advantages of the hydrostatic drive is precise and positive speed control. The operator can set his gasoline engine speed to meet the maximum required horsepower output for a particular job. Then, forgetting about his gas engine, he can control travel speed solely by the movement of the swash plate angle control lever. He can move his tractor at an almost imperceptible rate with no danger of stalling, and he can increase his travel speed without increasing engine speed.

To compensate for varying work loads, the transmission contains a load governing device that automatically reduces speed to increase torque when necessary.

The idea of a hydrostatic drive is not new. It has been worked on and experimented with principally in Europe for more than 30 years. It has been used commercially on ships and with heavy machinery. One U. S. manufacturer of ready-mix concrete trucks recently announced its use for turning mixing drums.

As to how practical it will be in tractor operations remains to be seen. International Harvester engineers, headed by A. E. Johnson, vice president of engineering and C. H. Meile, chief of engineering research, admit they have to solve several difficult problems before the hydrostatic drive can compete with conventional drives. The high cost of components for this particular type of drive is a major consideration but this difficulty may be licked by mass production. High fuel consumption is another problem and one that may not be so easy to solve.

READY
FOR YOU
NOW
SYLGAB'S
NEW CATALOG

The Latest
in the Concrete
Fireproofing and Construction
Field

This is your most reliable guide to "the right materials at the right time".

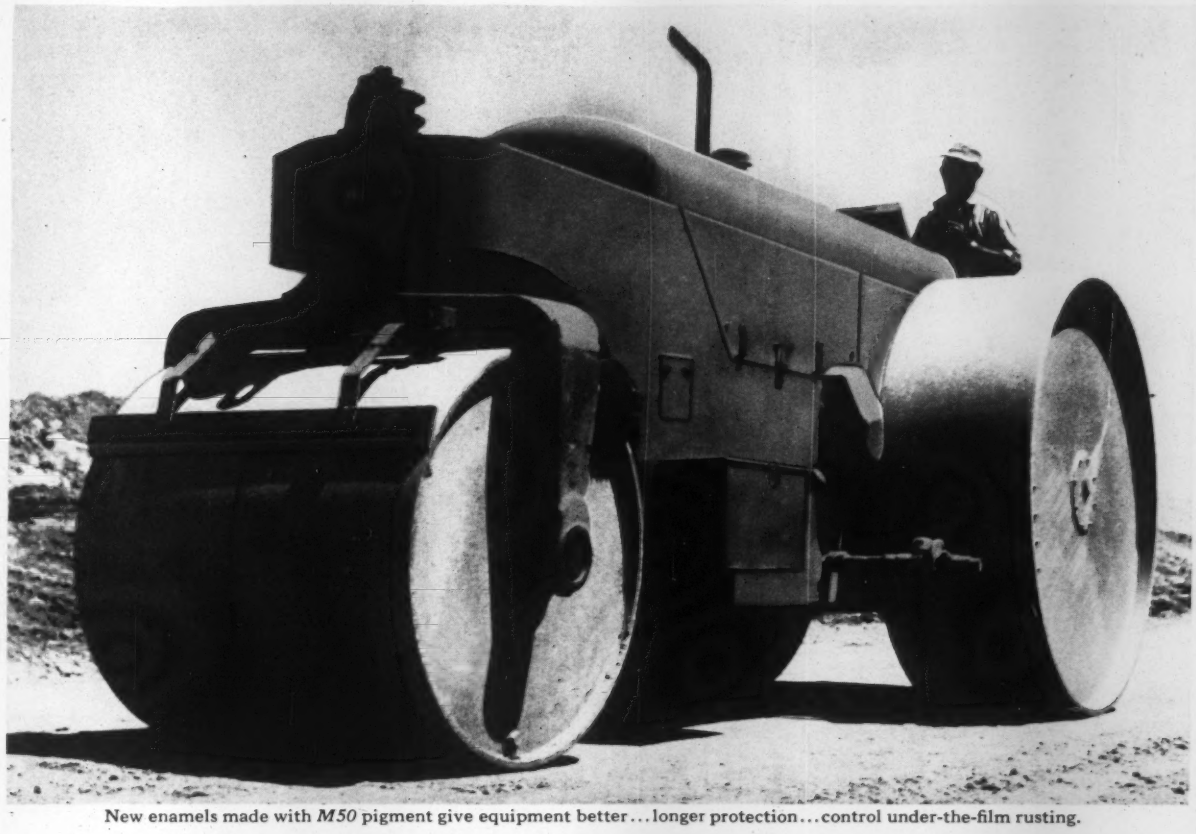
SYLGAB products
SAVE TIME TWICE

- Designed for instant installation... enables fast pouring due to their high rigidity.
- SYLGAB service assures you of no delays...no snafued shipments.

★

Sylgab Steel & Wire Accessories conform to the specifications of the Concrete Reinforcing Steel Institute. •
Quality — Service
Ease of Installation

PHONE, WIRE OR WRITE FOR CATALOG
SYLGAB
STEEL & WIRE CORP.
79-05 Cooper Ave., B'klyn 27, N. Y.
BEAM CLIPS • SPECIAL COLUMN CLIPS
EXPANSIBLE CLIPS
STRAIGHT AND COIL WIRE
HAIRPIN CLIPS • TOGGLE HANGERS
FORM SPACERS • BAR ACCESSORIES



New enamels made with *M50* pigment give equipment better... longer protection... control under-the-film rusting.

New! One-coat equipment enamels with built-in rust inhibition...

keep on fighting rust even when damaged in service

Now, for the first time, you can have the rust inhibition of a primer and the durability of a finish coat, combined in a single coat of enamel.

And what is more, the paint can be tinted to match most standard equipment colors.

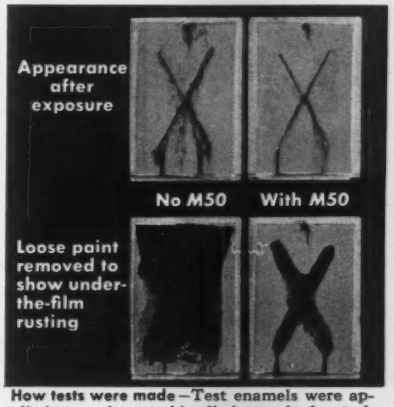
What gives these new one-coat enamels their exceptional properties is a unique new type of pigment, *M50*® basic lead silico chromate. In this pigment, the active ingredient is basic lead chromate solidly fused to an inert core. Fused lead chromate has not only exceptional rust inhibiting action, but also superior resistance to weathering.

Greatly inhibits under-the-film rust creepage, too

As you've probably noticed, when ordinary enamels are nicked or damaged in service the rust that starts spreads under the paint in no time. As this rust creepage progresses, paint flakes off to open the way for further corrosion.

Exposure tests (see photograph at right) at National Lead Laboratories show that this damage is very sharply reduced when *M50* pigment is in the enamel.

Before you order paint again . . . look into these unusual new enamels. They can be made up by your regular paint suppliers in nearly all standard equipment colors.



How tests were made—Test enamels were applied over clean, cold-rolled auto body steel, scored, and then exposed to 5% salt fog for 300 hours. The two panels at top permit you to compare appearance of enamels after exposure. The two panels at bottom have loose paint removed so that you can compare the true extent of rust creepage under each enamel. Note also, the greater film strength shown by the *M50* enamel.

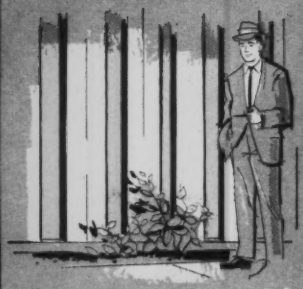
M50®

an oncor® TRADEMARK *Pigment... A Development of* **National Lead Company**

General Offices: 111 Broadway, New York 6, N. Y.

New steels are born at Armco

New Beauty

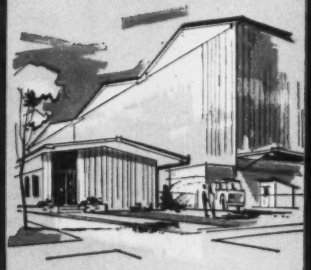


Classic new sturdy wall panel—the Armco Sculptured STEELOX® Panel—gives walls a dramatic, shadow effect.

Insulated Panels

Steel, snap-in insulated panels for interior finishing are now available for all models of the Armco Building line.

Two Roof Slopes



Greater variety: You can now choose from a low silhouette 2:12 pitch gable roof, or conventional 4:12 pitch gable roof.

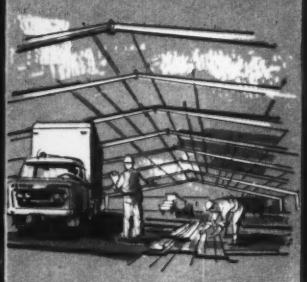
SEE THESE SWEEPING NEW FEATURES IN THE FAMOUS LINE OF ARMCO STEEL BUILDINGS

NEW Wall Beauty
NEW Ruggedness
NEW Comfort
NEW Economy
NEW Utility
NEW Sizes

Steel

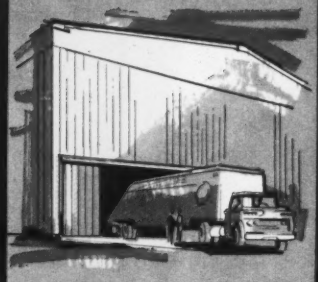
There's more for you than ever before in Armco Steel Buildings. Inside and out, you'll find a handsome new look, new features, new advantages.
Yet, important advantages that have won acceptance for Armco Steel Buildings for the past 40 years are still there. The durability, tightness, safety and salvability, the ease of finishing, the strength and attractiveness are still there.
But now you get even more! Here are the highlights from Armco Drainage & Metal Products, Inc., Middletown, Ohio.

Greater Widths



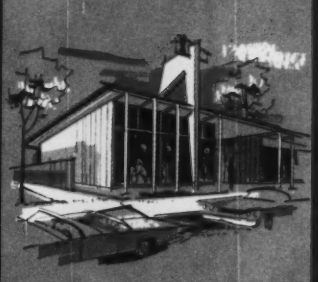
For utmost usability clear spans of 120 feet are now available, topping a range of 18 widths starting at 5'4".

New Heights



To the widest range of heights in the industry, Armco Buildings now add even more. Range is from 8 feet to 40 feet.

New Buildings



A brand new series of buildings with a single slope roof design is offered, in a variety of widths up to 24 feet.

GET DETAILS IN FREE LITERATURE

Armco Drainage & Metal Products, Inc.
6020 Curtis Street, Middletown, Ohio

Please rush details about the all-new Armco Building line. I am interested in a building for the following use:_____

Approximate size:_____

NAME_____

TITLE_____

ORGANIZATION_____

STREET_____

CITY_____ ZONE____ STATE_____

ARMCO DRAINAGE & METAL PRODUCTS

ARMCO

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company • The Armco International Corporation • Union Wire Rope Corporation

HYSTER

New compaction economy –

HYSTER® has it!

Hyster DW20A Compacters speed up the whole job. You get compaction at over 1,000 cubic yards per hour — at a cost of less than 3c per cubic yard — and maximum production from your scraper fleet.

Ask your Caterpillar-Hyster dealer for a demonstration on your job.

Cat and Caterpillar are registered trademarks of Caterpillar Tractor Co.

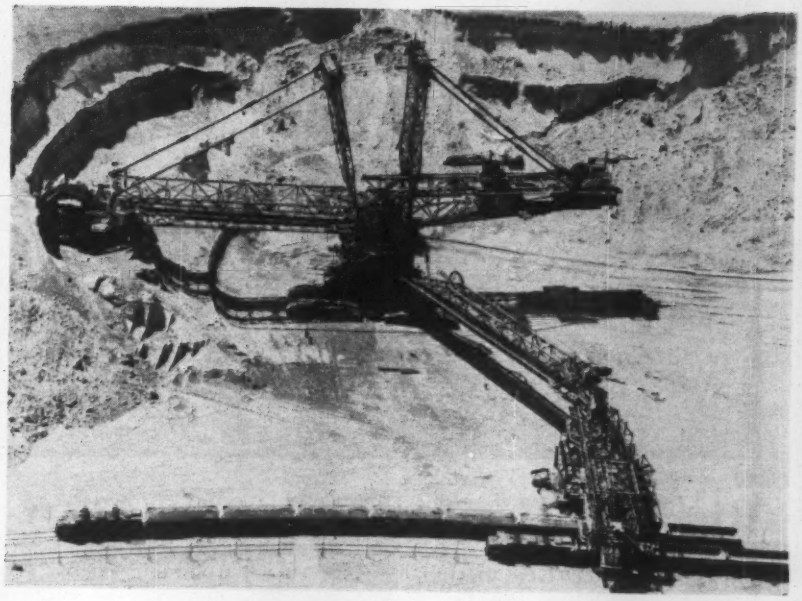
TRACTOR EQUIPMENT DIVISION — Construction and logging equipment
INDUSTRIAL TRUCK DIVISION — Lift trucks, mobile cranes, straddle carriers
MARTIN TRAILER DIVISION — Heavy machinery hauling trailers
INTERNATIONAL DIVISION — Overseas manufacturing, sales and service

Factories: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill. • Nijmegen, The Netherlands • Glasgow, Scotland • Sao Paulo, Brazil • Sydney, Australia (Licensee)

HYSTER

HYSTER COMPANY
TRACTOR EQUIPMENT DIVISION
P. O. Box 328 • Peoria, Illinois

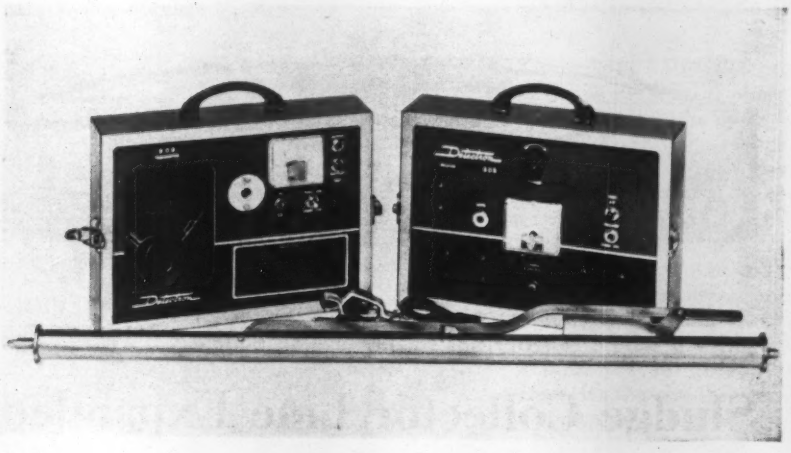
New Products



Big Digger Available in U. S.

Link-Belt Co. has acquired sales rights in the U.S. and Canada for LMG, German-made, bucket-wheel excavators, ranging up to 13,000 cu yd per hr (ENR July 2, 1959, p. 50).

Nearly 100 machines—in Europe, Africa, and Asia—have operated in various types of open mining operations. LINK-BELT CO., PRUDENTIAL PLAZA, CHICAGO 1, ILL.



Transistorized Pipe Detector

A new transistorized pipe detector is designed not only to detect and trace pipes, cables, and conduits, but to locate valve boxes, services, studs, and other metallic objects. The maker states that depth range on one-inch water pipes approximates 10 ft, and maximum depth range of the instrument on large lines is 20-25 ft depending upon soil conditions. Heat limitations inherent in transistors are said to have been eliminated by compensating circuitry, making the detector suitable for use in hot climates where heat instability of transistors has previously been a problem.

The instrument has an aluminum case and uses standard batteries. COMPUTER MEASUREMENTS CO., DIVISION 6, SYLMAR, CALIF.

47 top experts guide you in

Design, construction, and operation of today's HIGHWAYS

Just Out

HERE'S a big, fact-packed handbook on modern highway engineering — covering the entire field from financing, planning, and traffic engineering to design, construction, maintenance, and landscaping. In its 28 profusely illustrated sections by 47 outstanding authorities you quickly and easily find the information you want on today's best highway practices.

HIGHWAY ENGINEERING HANDBOOK

KENNETH B. WOODS, Editor-in-Chief

Head, School of Civil Engineering, Purdue Univ.

Associate Editors: DONALD S. BERRY, *Prof. of Civil Engineering, Northwestern Univ.*, and WILLIAM H. GOETZ, *Prof. of Highway Engineering, Purdue Univ.*

Prepared by a Staff of Specialists

1696 pages, 6 x 9, 672 illustrations, $25.00

EASY TERMS: Pay $7 in 10 days and $6 monthly

THIS comprehensive reference brings you a wealth of usable facts, methods, and data on such topics as finance and administration, route selection and layout, soil mechanics, testing, highway materials, basic highway design, rigid pavements, flexible pavements, and other aspects of highway engineering. Particularly helpful information is given on design of pavements to resist slipperiness . . . distribution of soils in North America . . . frost and permafrost as it affects highway design . . . photogrammetric techniques . . . and much more. All of this comes to you in clear, authoritative terms, with hundreds of helpful illustrations.

Among the many topics covered—

• highway administration and finance • planning • urban transportation planning • route selection, photogrammetry, and digital computers • acquisition of right-of-way • traffic engineering • soils, soil testing, and soil exploration • foundations, embankment, and cut slopes • drainage • permafrost • earthwork • contracts and specifications • aggregates • concrete materials and mix design • bituminous materials • slipperiness • geometric design • rigid pavements • thickness design methods for flexible pavements • highway maintenance • landscaping.

10 DAYS' FREE EXAMINATION

McGraw-Hill Book Co., Dept. NR-5-12
327 W. 41st St., New York 36

Send me Woods' HIGHWAY ENGINEERING HANDBOOK for 10 days' examination on approval. In 10 days I will (check one) ☐ send you the full price of $25.00; or ☐ $7.00, then $6.00 a month until the full price is paid. SAVE: We pay delivery costs if you remit with this coupon; same return privilege.

(PRINT)
Name .....

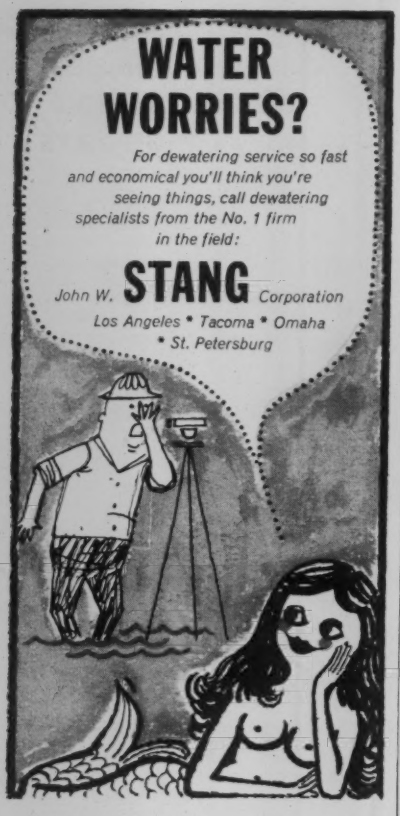
Address .....

City ..... Zone.... State.....

Company .....

Position .....

For price and terms outside U.S., Write McGraw-Hill Int'l, New York 36 NR 5-12

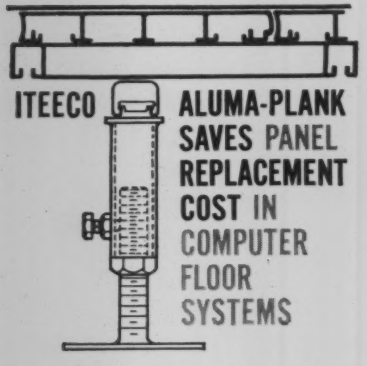

WATER WORRIES?
For dewatering service so fast and economical you'll think you're seeing things, call dewatering specialists from the No. 1 firm in the field:
John W. STANG Corporation
Los Angeles • Tacoma • Omaha • St. Petersburg

Rig Will Rip to 48 Inches

An hydraulic ripper for the International-Harvester TD-25 crawler tractor will penetrate to depths of 48 in.

The Greenville ripper has adjustable shanks for various ripping depths. Adjustments are made by changing the position of movable pins in the swing brackets. Shanks swivel 15 deg in either direction. Points are replaceable.

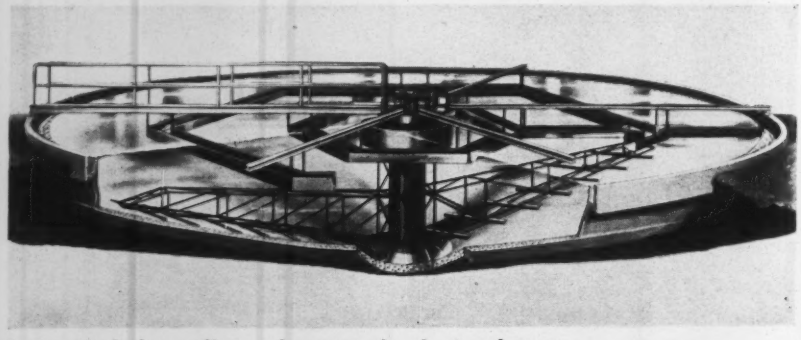
Available are straight shanks in 24-, 42- and 48-in. digging lengths; curved shanks in 24-in. lengths for use in non-blocky or non-slabby materials; and a new push block which can be attached straddling the center shank and swing beam for booster ripping. Pipeline and cable laying attachments are also available. The Greenville Steel Car Company, Earthmoving Equip. Div., Greenville, Pa.



Save up to 6 ft. of flooring ordinarily lost when repaneling access openings. Use Aluma-Plank 9″ x 27″ sections.

ITEECO'S new, lightweight extruded aluminum flooring is the only modular plank system available.

ITEECO
INDUSTRIAL TUBULAR EQUIPMENT CO.
12906 Saticoy, North Hollywood, California
TRiangle 7-9821



Series U sludge collector has steeply sloping bottom.

Sludge Collector Line Expanded

Two additional series of sludge collectors for water, sewage and industrial waste treatment settling tanks have been announced.

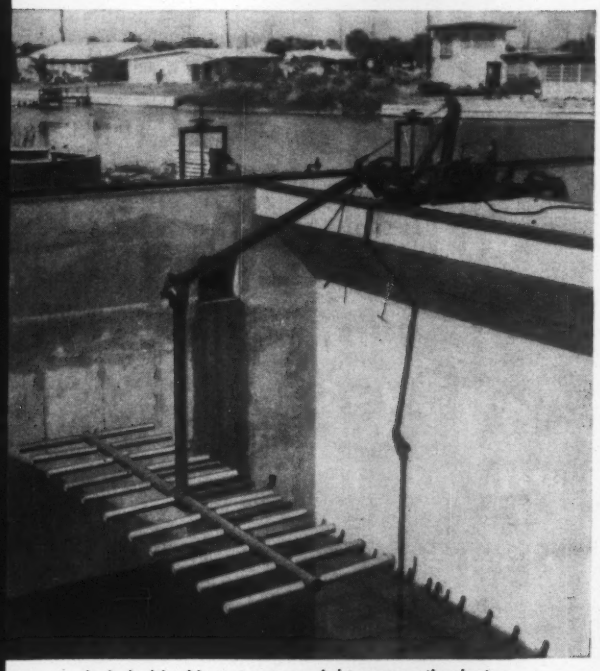
The Series U is a settling tank with a rapidly sloping bottom, tank-type sludge collector and multiple effluent weirs. The maker cites savings in tank construction costs since the sloping bottom permits the tank volume to be reduced as much as 25% without reducing the surface area or overflow rate.

Series A is an aeration sludge collector for pre-aeration and settling. It consists of a single circular tank in which both aeration and settling take place. The collecting mechanism removes the solids from both the aeration and settling compartments, the manufacturer claims.

These units are available in two types —one for preliminary aeration of 30 to 60 min and the other for extended aeration up to 24 hours or more. Link-Belt Co., Prudential Plaza, Chicago 1, Ill.

More than five miles of extra heavy galvanized Wrought Iron Pipe, from 1½-inch to 3½-inch, were used in the construction of the Treasure Island, Florida, Sewage Collection Plant.

Wrought Iron Pipe provides a bulwark against corrosion at Florida's Treasure Island Sewage Treatment Plant



Included in this system are eight pneumatic ejector lift stations which are supplied with compressed air transmitted in Wrought Iron Pipe from the blowers and storage located at the Treatment Plant.

Compressed air piping used in the activated sludge process must provide maximum operating life, minimum maintenance.

At the new Treasure Island, Florida, Sewage Treatment Plant, consulting engineers specified corrosion-resistant Wrought Iron Pipe for this service. Severe internal corrosion and clogging from loose rust occur with ordinary piping materials in this service. But not with Wrought Iron. Its corrosion product is dense and highly adherent, and actually *protects* the underlying metal from further corrosive attack.

Today, specifiers and plant operating men are getting a Wrought Iron that is the most versatile material yet developed to help fight corrosion. New 4-D Wrought Iron faces corrosive attack with far greater resistance, even, than standard Wrought Iron, its dependable predecessor.

4-D was achieved by substantially increasing the deoxidation of the base metal, slightly increasing the phosphorous content and using a more siliceous iron silicate. 4-D is available now from your distributor. Write us for new 4-D Wrought Iron literature. A. M. Byers Company, Clark Building, Pittsburgh 22, Pa.

City of Treasure Island Sewage Plant Improvement
Consulting Engineers: Gilbert W. Clifford & Associates
Piping Contractors: Paul Giuliani & J. E. Milam Co.

BYERS 4-D WROUGHT IRON

TUBULAR AND FLAT ROLLED PRODUCTS

ALSO AMBALLOY ELECTRIC FURNACE QUALITY STEELS AND PVC PIPE AND SHEET

Corrosion costs you more than Wrought Iron

Tracing Cloth or Drafting Film*?

Arkwright Makes Them Both

*Based on DuPont "MYLAR" polyester film.

THROCKMORTON FRISBIE
BARSTOOL & FRISBIE
HARMONICA BAY, CALIF.
CONSULTING ENGINEER

On being asked where he intended to put the new multi-billion dollar Harmonica Bay bridge, Frisbie replied:

"On Arkwright of course! You know for a long time I was known as Feathers Frisbie. But . . . then I saw the light . . . or I should say, the perfect working surface. You know . . . no blobbing, no feathering, no ghost . . . permanent translucency and all that. And with Arkwright, I have a choice of a superior working surface on both tracing cloth and drafting film. Now . . . when I call on my clients . . . I get a chuckle when I hear them say, 'Here comes Frisbie sharp and clear on Arkwright.' Join me, won't you."

For perfect performance on cloth, specify the roll with the Blue Line — Arkwright. See for yourself the advantages of Arkwright's perfect coated surface on drafting film. Film available in several thicknesses. Both cloth and film in cut sheets or rolls. Write today for free samples.

Arkwright—Interlaken, Inc., Arkwright Finishing Division, Fiskeville, R. I.

It's precisely right on Arkwright!

Arkwright-Interlaken, Inc.

ARKWRIGHT
FINISHING DIVISION

. . . New Products

Nuclear Gage Measures Soil Moisture, Density

A portable moisture-density gage which, according to the maker, will give precise measurements of moisture content and density of soil and similar materials, is now available. The device is intended for wide application in the road building and construction industries since measurements may be taken on the job location without disturbing any of the material under test.

Design of the gage is based on the laws of absorption, scattering, and reflection of gamma rays and neutrons. The device employs a nuclear probe connected to a portable scaler; the probe is placed on a smooth surface to make the measurements. Gage is being marketed by Soiltest, Inc., 4711 W. North Ave., Chicago, Ill., for Nuclear-Chicago Corp.

Flexible Steel Forms Pre-Set for Curvature

Flexible-steel concrete forms can be pre-set to give any desired edge contour, according to the manufacturer. They are designed for use in forming curved low walls, sidewalks, curbs and gutters. Called Radi-Lok forms, they are said to be simple to use, light, strong and durable.

Each form is set by driving supporting steel stakes in the desired positions, adjusting the form band to give the correct curvature, and tightening lock nuts. After concrete is cast, the form can be repositioned to repeat the same curve with no additional adjustments. Forms are supplied in 10-ft. lengths, with heights from 4 to 24 in. Binghamton Metal Forms, Box 848, Church Street Sta. New York 8.

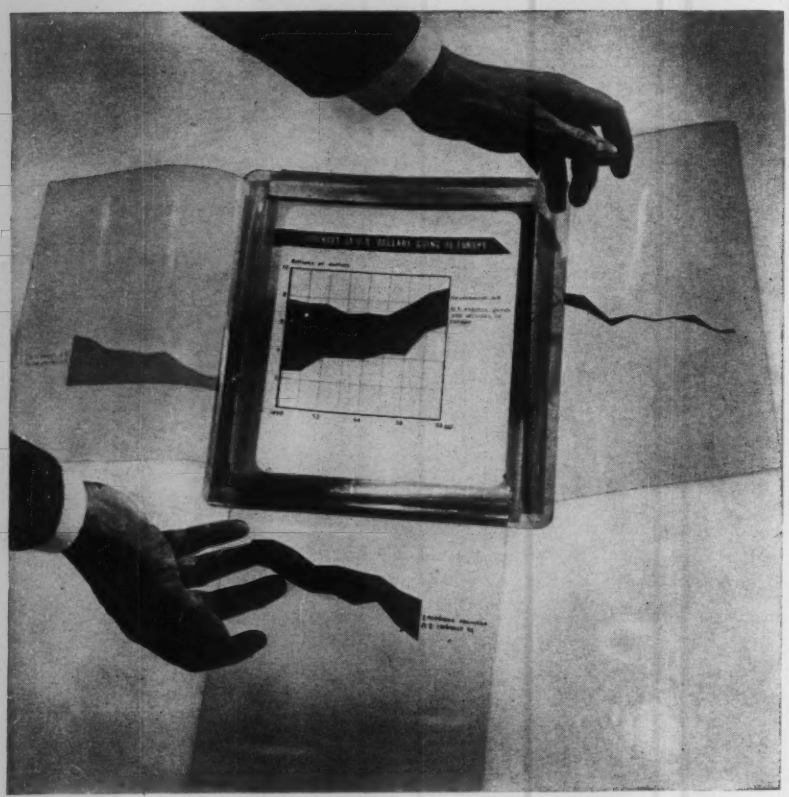
U.S.F. & G. bonds more construction – year in, year out – than any other insurance or surety company.

THE USF&G

United States Fidelity & Guaranty Company, Baltimore 3, Md. • Casualty · Fire · Marine Insurance • Fidelity · Surety Bonds

OZALID *NEWSLETTER*

NEW IDEAS TO HELP YOU WITH ENGINEERING REPRODUCTION AND DRAFTING



Ozalid Viewfilms produce color images in seconds . . . and at lower cost than conventional methods.

Need low-cost color in a hurry?

Four-color, three-color, or even two-color for that matter . . . no problem; Ozalid's Viewfilms provide the perfect low-cost answer.

Suppose we want to produce a performance chart in which each factor is a different color.

It's a snap. Just take translucent paper and draw the desired curve or dotted line (as the case may be) on the sheet.

Next, run the master through your Ozalid machine together with an Ozalid Viewfilm of the proper color. Want to add more material in a different color? Just prepare another master, select a different colored film, and run them as you did the first pair. When you're all through, overlay the films in sequence and tape them into register. Your result is a composite color chart that's very dramatic . . . very convincing!

This is just one illustration to start your mental salivary glands working. We are sure that you can find uses we haven't even dreamed of, once you get going. And if you discover any new applications for this best of all possible color worlds, tell us about them so we can spread the good news to others.

When it comes to cost estimating . . .

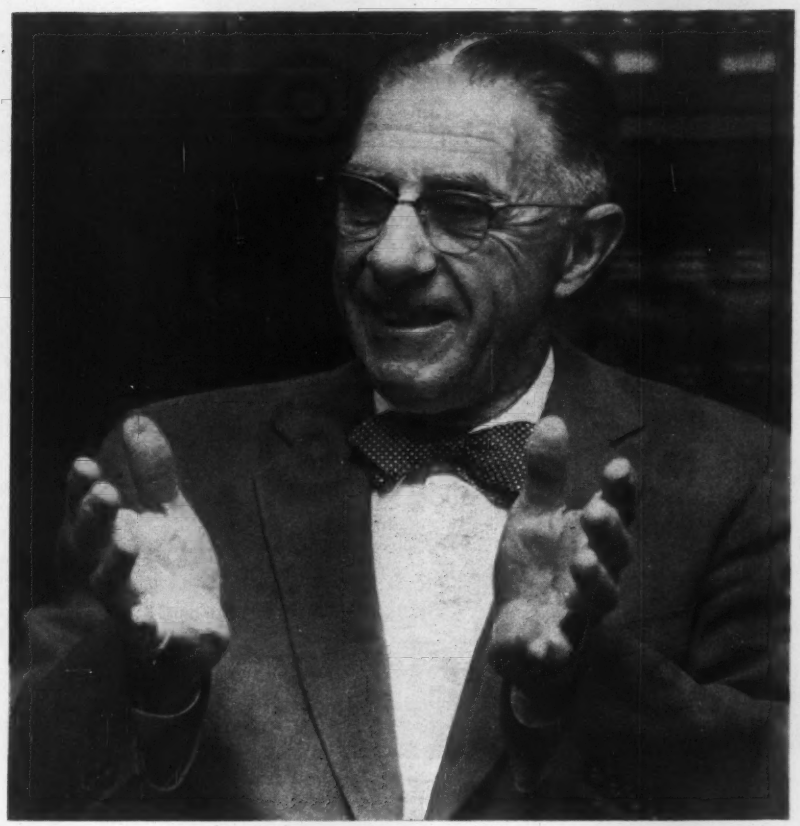
. . . there's nothing like a handy white-printer to cut preparation time of cost estimates, according to the Stackpole Carbon Company, St. Mary's, Pa. The company's Supervisor of Cost Estimating has just written us a letter on the subject which we pass on to you verbatim. "Our estimates are made in pencil on printed translucent vellum in pad form. These are reproduced on specially cut and punched Ozalid copy paper. Originals carry only basic information that has to remain constant. And from the originals we produce duplicate originals on Ozalid sepia line intermediate paper (#402 IT) as required, and these are used until the basic information is obsolete. To revise a cost, it is only necessary to add current rates and extend. With this simple Ozalid method we have eliminated typing, proofreading, and copying errors."

The Supervisor goes on to say that Stackpole uses Ozalid copying in many other areas of its business because of convenience and economy. Perhaps we'll be able to tell you about these uses in a future *Newsletter*.

Here's what 100 usable feet per minute can do for you

Speed up your production? Of course! But that's only the beginning. Look at it this way. One Printmaster 1000® working at a usable 100 feet per minute matches the output of several smaller, slower machines *but takes up less valuable floor space while handling widths up to 54 inches!* You save on production time and costs due to higher working speeds! And the Printmaster 1000 is probably the toughest, most durable unit ever produced. This means even greater savings in downtime and service charges. Our first recommendation for any shop having heavy work loads is this 100-foot champ . . . the Printmaster 1000.

Ozalid—*Division of General Aniline & Film Corp.* • *In Canada: Hughes-Owens Co., Ltd., Montreal*



Miami's Wertz: A quick look stretched to 19 years

Keeping Water in the Black

Working on hands and knees in a well-kept backyard strawberry patch in Miami, a man called "Caesar" wonders sometimes about bathwater for tourists in 1980.

"Caesar" is C. F. (for Claude Franklin) Wertz, to be installed next week as president of the American Water Works Association.

His domain is the profitable Department of Water and Sewers in Miami. There he rules a $50 million empire that unfailingly pours money back into the city treasury—usually half a million dollars a year.

He rules a 451-man department with undisguised firmness. Diplomacy he knows, but no one has yet accused him of timidity.

The Wertz installation as AWWA's president at its five-day annual meeting at the Americana Hotel in Bal Harbour will be quiet. He is saving his fire and advice for the Detroit meeting at which he'll wind up his term next year.

Caesar is a graying, tanned, bespectacled man of 62. He plops his feet on a littered desk, swivels his chair interminably, stabs the air with his finger, and answers questions in straight, no-nonsense language.

He is no politician. "We run this department like a private firm. When the weather is dry, we make money. I hope it doesn't rain."

Sometimes he refers to himself in the third person, using the classic nickname.

He acquired the name in a high school Latin class in Reading, Pa., in double-play fashion: Claude-to-Claudius-to-Caesar. It stuck.

Mr. Wertz, incidentally, isn't overly impressed with high schools these days.

"Kids come out of school without ever hearing of a transit or level. They're too busy with dancing and bowling and all those frilly dills. They even skimp on math."

• **His job is getting bigger**—Only six years ago a somewhat uninformed but nationally known business prognosticator took a look at Miami's underground salt contamination and "lack of adequate freshwater supplies," and forecast: Miami will become a ghost town.

Mr. Wertz sees a different future: He figures that by 1980 the city will have a million in permanent population, face a normal demand of 170 million gallons a day, and need 250 million gallons daily in the peak tourist season. The system serves 550,000 persons now.

The misguided forecaster went astray when he glanced at Miami's natural water woes. It is one of the few large cities in the world built on land only a few feet above sea level. The land is flat, devoid of hills and highlands to catch the rainfall, which averages 42.90 in. on the beaches and 56.41 in. 10 miles inland. The sources of fresh water are lakes and streams well above sea level.

For years Miamians found their wells going brackish as salt water seeped inland underground through the limestone rock underlying all of South Florida.

As late as 1944, the Water Board was replacing its leaky wooden mains with more redwood staves and wrought iron bands. The mains were an "economy measure" relic left over from Miami's famed boom of 1925. In 1944 the mains leaked up to 4 million gallons a day.

Even after the wooden mains were abandoned, the trouble didn't end. The old pipes started caving in under streets and sidewalks—and had to be dug up for good.

Caesar Wertz first stepped into this mess in 1941 as resident engineer for Day & Zimmerman, Inc., Philadelphia consulting engineering firm. Chase National Bank of New York had selected the firm as a watchdog in a trust indenture with Miami. So the company flew Wertz to Miami for a quick look. He was smitten for good by the sea-sun-sand package.

• **Sanitary engineering a quirk**—After he finished high school in Reading in 1915, a friend offered him a job as a rodman on a survey team at 50 cents a day. "Then my daddy came along," Caesar recalls, "and said if I'd work he would scratch enough to send me to Penn State."

At Penn State, young Wertz earned room and board by drumming up trade for a 25-student non-fraternity "eating club."

Why sanitary engineering? "It was just a quirk. People thought I was crazy. I didn't like chemistry. That was a mistake. Now I employ six chemists."

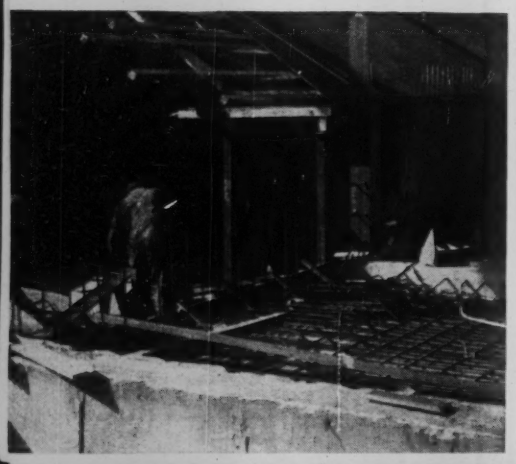
His first job was working out of

Truscon Concrete Reinforcing Bars were used under the entire roadway of this overpass of railroad and rapid transit tracks in the modern highway system now being completed in Cleveland, Ohio. Re-Bars are designed to grip concrete and provide positive bond and anchorage.

TRUSCON CONCRETE REINFORCING BARS

provide positive bond and anchorage...

Truscon provides detailed placing drawings for your bar requirements. All shipments are delivered to the job site bundled and properly tagged for quick identification and placing.



In all types of modern building construction, you will find Truscon Concrete Reinforcing Bars on the job. Truscon Re-Bars for concrete slabs, footings, walls, beams, girders, and columns.

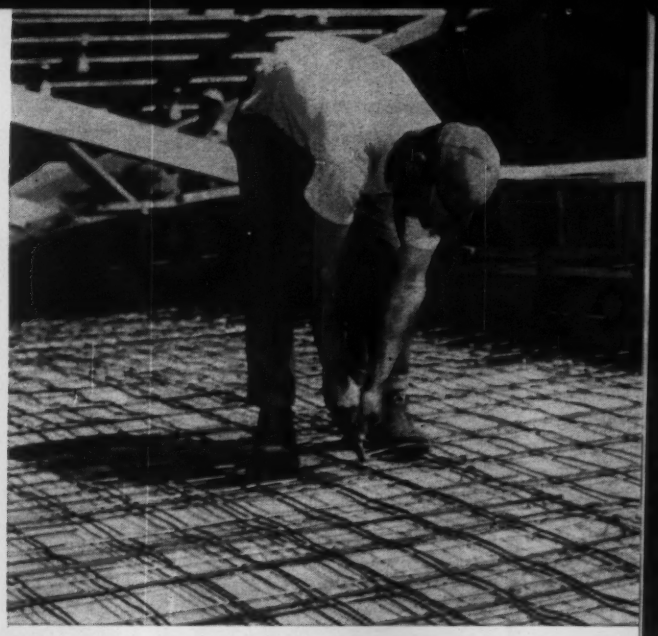
Truscon Re-Bars are rolled from new billet steel and are designed to provide positive bond and anchorage. Concrete, reinforced with bars, is protected against destructive cracks and practically eliminates all maintenance expense.

Truscon has bar fabricating facilities in major building areas and can provide efficient service to enable you to meet your construction schedules.

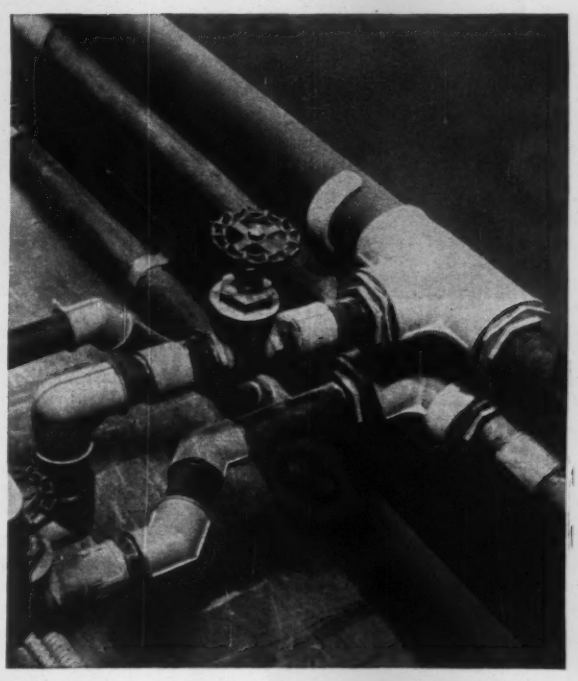
Truscon also furnishes high strength reinforcing bars with 75,000 psi minimum yield point. These bars are ideal for columns, foundations, missile pads, and other concrete constructions subject to exceedingly heavy pressures. They meet ASTM specifications A-431-58.

Include Truscon Reinforcing Bars in the plans for your next job. Call your Truscon representative or write for more information. Use the convenient coupon.

Truscon Concrete Reinforcing Bars provide strength in reinforcing concrete slabs, footings, walls, beams, girders, and columns. They support heavy weights and provide maximum protection against the attacks of time and the elements.



REPUBLIC ELECTRIC RESISTANCE WELD LINE PIPE. Uniformity in wall thickness and concentricity eliminates costly weld burn-throughs due to thin spots. Accurate line-up for welding is assured. High ductility and yield strength simplify bending and provide high pressure dependability. Uniformity of Republic Electric Resistance Weld Line Pipe also speeds welding. Write for complete information.



REPUBLIC SRK® PLASTIC PIPE makes even crowded pipe work easy. Cutting requires only ordinary handsaw. Joints are easily "welded" with brush-applied solvent and socket-type fittings. Republic Plastic Pipe products are ideally suited to a wide variety of applications. Flexible, lightweight, Republic FE resists the abuse of common corrosive elements and freezing weather, is non-toxic and immune to electrolytic action. Investigate the many advantages of Republic Plastic Pipe. Write today.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. EN-9536
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on the following products:

- ☐ Truscon Concrete Reinforcing Bars
- ☐ Truscon High Strength Bars
- ☐ Republic Electric Resistance Weld Line Pipe
- ☐ Republic Plastic Pipe

Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____

WET JOB?
whether
POWER PLANT

or other wet work—
for "quick dry"...specify...

GRIFFIN
WELLPOINT CORP.
SALES • RENTAL • CONTRACT
881 E. 141st St., New York 54, N. Y.
Hammond, Ind. • Jacksonville, Fla.
Houston, Tex. • W. Palm Bch., Fla.

The QUICKEST way to get

Reinforced Concrete Designs Revised 1959...

Second Edition! Third Printing!

447 pages

over 75,000 copies in use

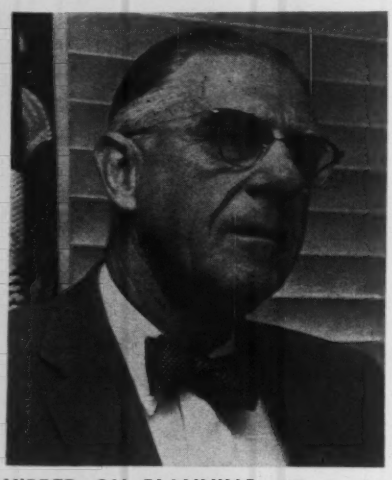
This valuable handbook provides Reinforced Concrete Designs worked out to the latest A.C.I. Building Code. Send check or money order today for your 1959 copy.

Prepared by the Committee on Engineering Practice

$6.00 postpaid

10-Day, Money Back Guarantee
NO C.O.D. ORDERS

CONCRETE REINFORCING STEEL INSTITUTE
38 S. Dearborn St. (Div. D), Chicago 3, Illinois



HIPPED ON PLANNING: "Every city should keep re-evaluating."

Harrisburg, meandering over 13 districts for the Pennsylvania State Board of Health.

In 1928 he became a consulting engineer with Fuller & McClintoch in Philadelphia. He helped set up sewage plants at York and Hanover, Pa. and Middleburg, N. Y.

Then the depression derailed him. "But I was lucky," says Caesar. "I got three job offers. And I picked the wrong one."

He went to work for another consulting engineering firm in Cleveland, Gascoigne & Associates. That didn't last and he found himself back home in Reading, among the ranks of the unemployed.

• **Have slide rule, will travel**—After a flurry of letters to a New York company about a job in El Paso, Tex., he suddenly landed in Chicago with Nichols Engineering & Research, Inc.

"I traveled all over Michigan, Indiana, Ohio and Illinois with a garbage-incinerator salesman," Caesar recalls.

A few months later in Dearborn, Mich., he helped build the first sewage-sludge incinerator in the nation, the Nichols-Hershoff multiple-hearth furnace.

"I tried to sell Cleveland an incinerator too, but they said I was nuts," he recalls. "Cleveland now has at least six such furnaces."

In 1934 he returned to Philadelphia and tried to sell industrial incinerators. "I didn't sell enough to pay the office rent."

Soon he was back with Fuller & McClintoch, and in 1936-37 he helped design and build the first large (11 mgd) sewage plant at New Britain, Conn. It used the Guggenheim chemical precipitation process.

• **The road to Miami**—In 1937 the late and great Charles Emerson, who'd taken an interest in the Wertz career, steered him to Cleveland; that quickly led to Day & Zimmerman, Inc.; and to Miami—where he has stayed put for 19 years.

Caesar arrived in Miami the year the city fathers created a no-politics-allowed water and sewer board after amending the city charter and buying the water-distribution system from a private firm, then part of Florida Power & Light Co.

The sale came after an $8-million revenue-bond issue. Three years later the board refunded $7 million, chopped the interest rate to 1.87% and saved $945,000.

(Interest rate on the city's 10 outstanding revenue bond issues in 1960 averages 2.94%.)

A "dam" war was also in full sway when C. F. Wertz hit Miami. Salt water had killed 15 wells within the city and was threatening inland wells at Hialeah. The heavier salt water was moving steadily upstream in the Miami River and a dam was deemed essential. But upstream owners, fearing floods, bitterly fought it.

Finally, an adjustable tidal gate was built that satisfied almost everyone. That was a turning point.

Meanwhile, ample water supplies, free of seawater, were found inland in deep rock formations seven miles west of Hialeah. The city made a deal with the state for 1,815 acres of water reserve at $5 an acre.

World War II brought another complication, but it ended happily. Quicklime needed for softening water (from 260 parts per million in hardness to 85) became expensive and hard to get, so Miami built its own lime recalcining plant. It cost about $1.25 million and paid for itself in the first five years.

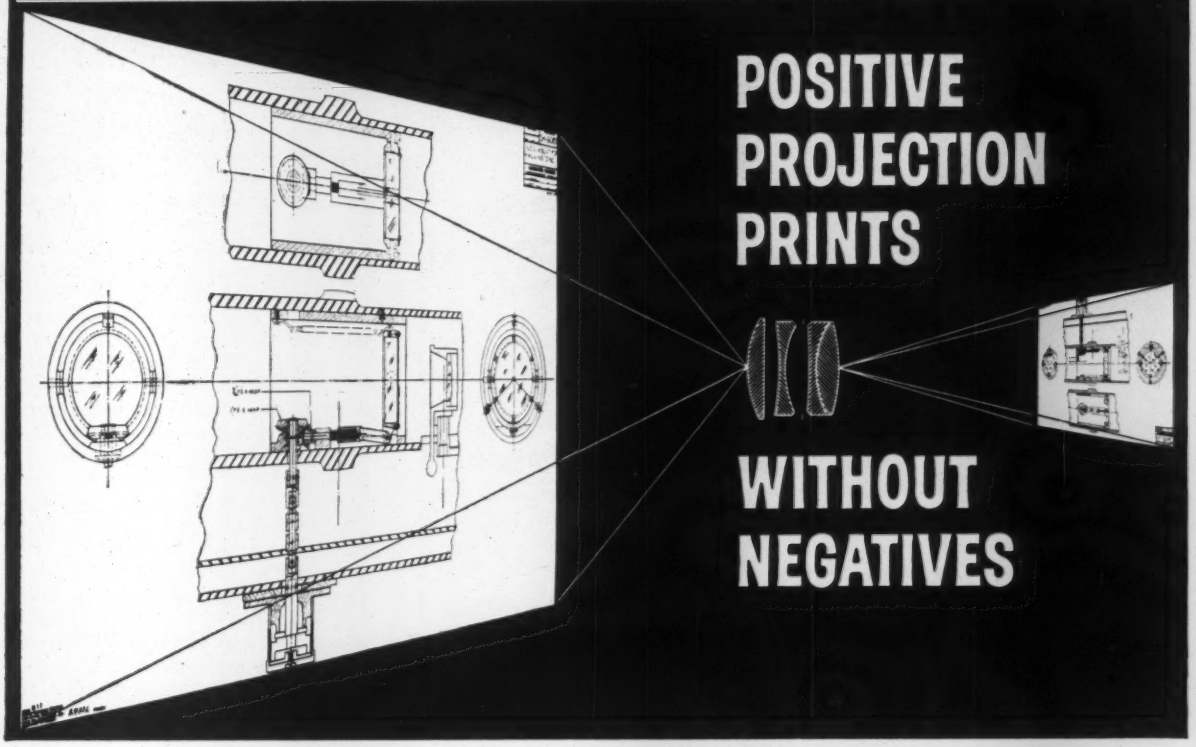
• **What makes up the system?**—Today Caesar's water empire comprises 2,512 acres of land, 36 wells, 2 treatment plants, 10 miles of supply mains, 34 miles of transmission mains, 9 ground storage tanks, 6 pumping stations and 881 miles of distribution mains. The distribution facilities alone are valued at more than $20 million.

The city sells water—both wholesale and retail—to 14 other smaller cities and towns. The rate boils down to about 28¢ per 1,000 gallons—delivered.

The city's two water treatment plants have a combined capacity of 140 million gallons a day. Miami's peak single-day demand in the sultry subtropical heat last summer—with lawn sprinklers going full blast—was 125 million gallons.

• **Sewerage progress**—Miami's sewerage

NEW FROM KODAK **Kodagraph Autopositive Projection Paper**



Here's an entirely new direct-positive camera-speed paper with special quick-processing, wash-off emulsion . . . no fixing required.

Now, with a *single* shot in camera or enlarger, you can make—on paper—high-contrast *positive* reductions or enlargements of positive originals . . . or you can make negatives from negatives. Develop in Kodagraph Autopositive Projection Developer (no fixing required), then rinse off emulsion and wash. *Specially suited* for making reduced-size intermediates of engineering drawings, or enlarged positive prints from microfilm positives. Also ideal for copying any document or art pasteup.

Available in two weights: *Extra Thin* for "intermediate" use in blueprint or whiteprint equipment, and *Standard* for general copying.

Plus these two favorites . . . now better than ever!

IMPROVED Kodagraph
Autopositive Paper, Translucent

Exposure speed is stepped up. Line sharpness is greatly increased, while background density is decreased—giving you intermediates which produce sharper, cleaner prints. Greater roomlight tolerance, especially to fluorescent light, makes printing and processing easier.

IMPROVED Kodagraph
Autopositive Paper, Extra Thin

All the advantages found in new Autopositive Paper Translucent on an extra thin base. Gives you superb intermediates at a minimum cost. See for yourself how these NEW FROM KODAK reproduction materials make the job easier, better! Call your Kodak dealer or write: to Eastman Kodak Company.

Graphic Reproduction Division, Eastman Kodak Company, Rochester 4, N. Y.

Kodagraph Reproduction Materials

"Make the job easier . . . better!"

Kodak

This man is replacing dollars with sand!

The soil compaction job for the Boise-Cascade Corp. plant site proceeded at a rate of 4,000 cubic feet of soil compacted per hour with two Vibroflot machines. Each compaction consumed 3 or 4 tons of sand.

100 plus contracts have proved that

Vibroflotation®

saved money on foundations

From Vancouver to Maine, from Newfoundland to Florida, architects and engineers have stretched their building budgets by specifying soil compaction by VIBROFLOTATION.

Find out how you can do the same...

Write for booklet E-24.

Proven Applications

Deep Foundations • Dams
Bridges • Airports • Tunnels
Commercial Foundations
Industrial Foundations

VIBROFLOTATION FOUNDATION CO.
930 Fort Duquesne Boulevard
Pittsburgh 22, Pa.
ATlantic 1-2500

system developed a little later than the water system, but progress has been rapid since 1952.

For years the city simply dumped its raw sewage into the Miami River and Biscayne Bay. Both were slowly turning into cesspools.

In 1952, voters approved a $16-million general-obligation bond issue and $11 million in revenue bonds (both at 4.3% interest). Bulldozers started gouging out a sewage treatment plant on an isle in the bay, Virginia Key.

The city hiked sewer service charges from 35% to 100% of the water bills to help pay the cost.

In 1956 another $7 million went for four big interceptor lines to funnel the raw sewage to the treatment plant. Since then, pollution has dropped dramatically. Health Department and Marine Laboratory scientists from the University of Miami now report a 90% pollution reduction.

Still without sewage treatment, however, is Miami Beach, the self-styled "Playground of the World." It unglamorously dumps raw sewage into the ocean a mile off-shore.

Caesar Wertz was the key man in much of Miami's sanitary development. This he denies politely, crediting the five-man Water and Sewer Board; its chairman, J. E. Preston, Miami manager of the Gulf Oil Corp.; and William A. Glass, whom Wertz succeeded as director in 1955.

He does, however, readily acknowledge one trait: He is a bug on planning.

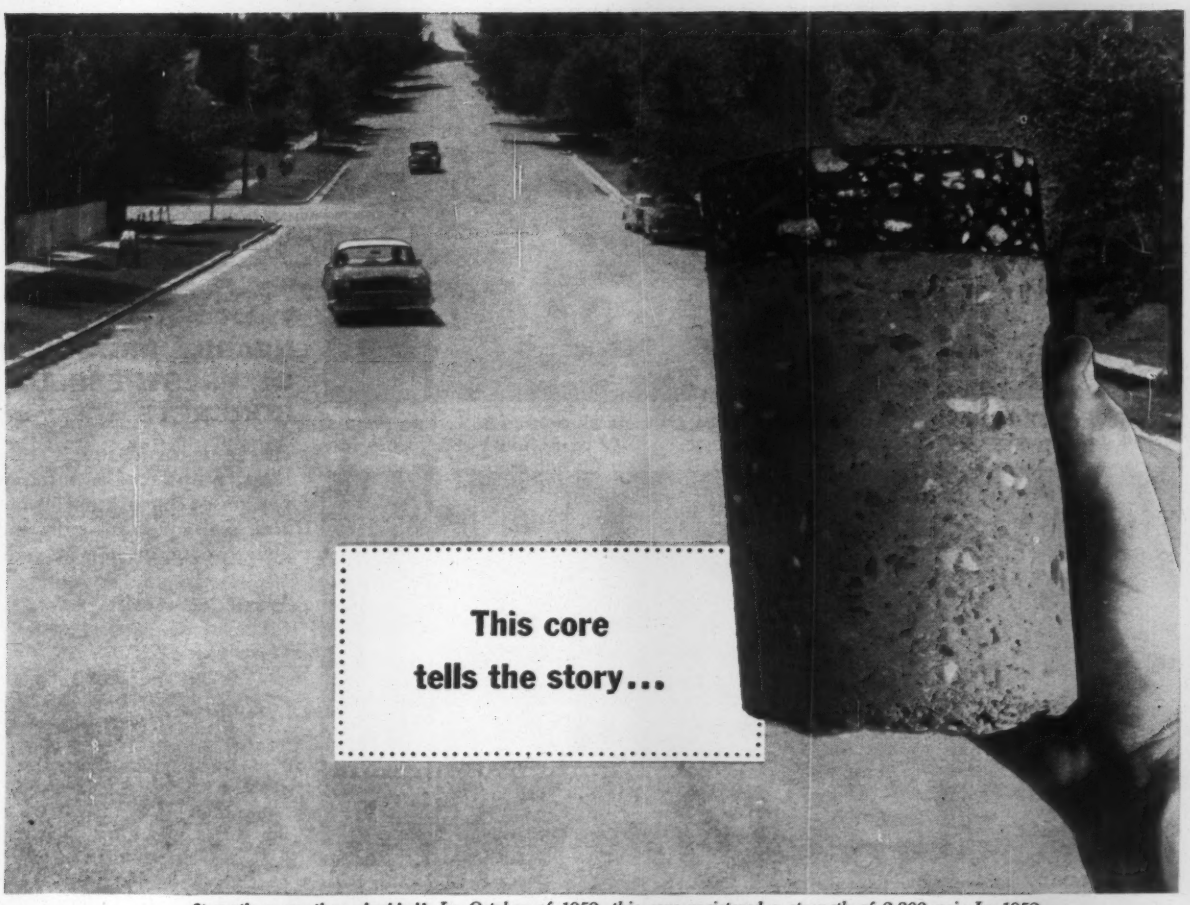
"I preach it," he proclaims. "Every city ought to know what it will need in the next 20 years. And every city should keep re-evaluating."

• **Five-year spending plan**—His own long-range plans carry to 1980. Before 1965, however, he figures on spending $10 million including a $3-million lime-plant addition, construction of $350,000 in new mains annually, and the first $2-million phase of construction of a new 100-mgd treatment plant.

This spring he is calling for bids for a 36-in. line that will cost about $700,000 and eventually will tie into a new line going across Miami's newest causeway to Miami Beach.

• **Unanswered question**—Perhaps the biggest question mark facing the Miami Water and Sewer Board today is a new form of government called Metro. It combines suburban and city services alike in a massive centralization of government.

The question is whether Metro will take over Miami's water system. But in Miami, the odds makers figure Caesar will take over Metro.



Strength more than doubled! *In October of 1959, this core registered a strength of 2,200 psi. In 1952 samples from these streets had a 7-day strength of 936 psi. Ten per cent portland cement was used.*

In just 7 years, strength of soil-cement streets in Gillette, Wyoming, increased 135%

...soil-cement pavement grows stronger year by year!

Core test proves conclusively: soil-cement outlasts any other low-cost paving material! Soil-cement is stronger inch for inch than any other paving material, short of concrete. Yet, in most cases, 75% of the materials are free.

Your main ingredient is soil . . . even old gravel bases or broken-up blacktop can be mixed in. This is combined with portland cement and water, then covered with a thin bituminous wearing surface when the soil-cement hardens. Contractors have built as much as two miles of soil-cement pavement in one day.

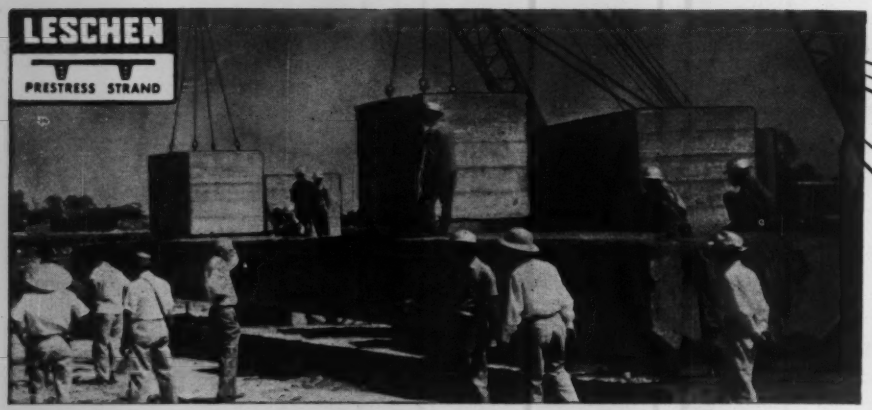
Potholes or soft spots are a thing of the past. Soil-cement has beam strength that spreads the traffic load over the subgrade. Maintenance is really low. Coupled with a low first cost, it means street budgets go further . . . permitting long range programing by engineers.

More than 500 cities and towns throughout the country have successfully used soil-cement paving.

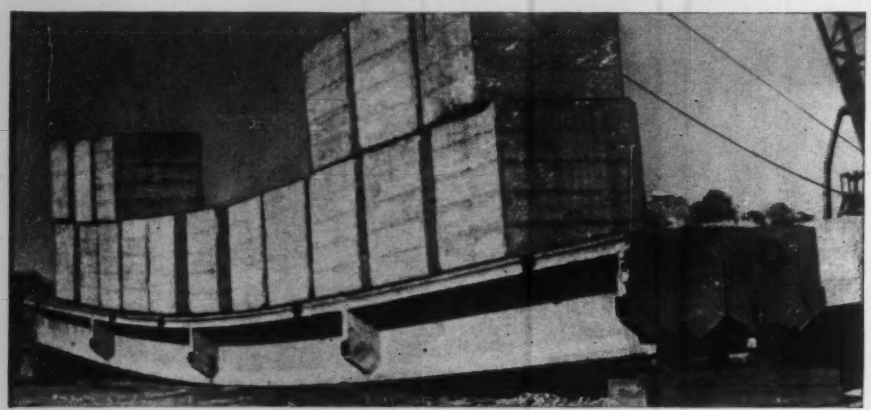
PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of portland cement and concrete

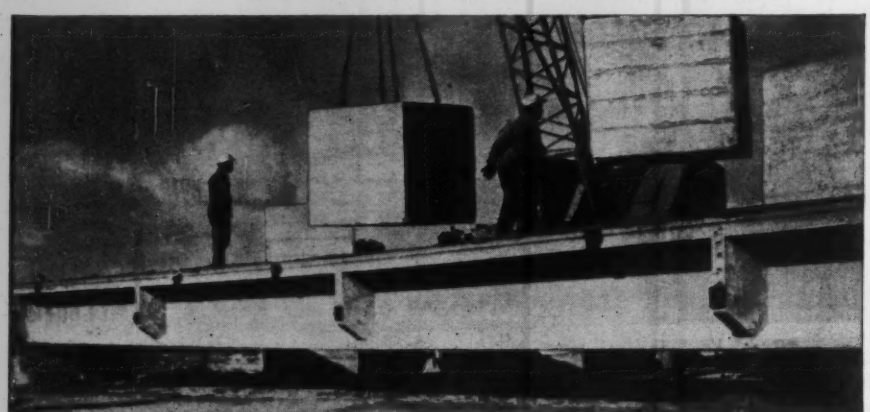
MODERN
soil-cement



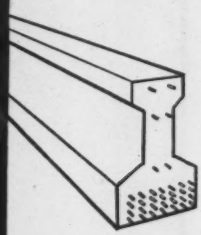
START OF TEST LOADING on two 80-foot prestressed girders. Each contains 26 Leschen Prestress Strands under tension.



153-TON LOAD—more than four times design load. Deflection was 24 inches with no failure of concrete or strand. Test made for acceptability of 1400 girders for South Vietnam construction project.



LOADS REMOVED—approximately 85% recovery of deflection immediately. Only hairline cracks evident. Designer—Capital Engineering Corp.; General Contractor—Johnson, Drake & Piper of Vietnam, Inc.; Technical Assistance—Freysinnet Co., Inc.



TALK WITH A NEARBY PRODUCER OF PRESTRESSED CONCRETE

He can discuss technical problems, point to examples of prestressed construction in your area, and advise on costs and delivery of beams from his yard.

OR WRITE LESCHEN

Leschen supplies producers with the tensioning material—prestress strand. To insure uniform production of highest quality tensioning steel, Leschen has installed the world's newest and most modern wire mill and other specialized equipment. Write for literature giving typical uses and engineering data.

Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Missouri.

PRESTRESSED BEAM WITHSTANDS 4X DESIGN LOAD!

Prestressed concrete is unique. Its properties are a delight to creative architects and engineers. Thinner sections, longer spans, lower depth-to-span, longer cantilevering without ballast beams, reduction in weight, economy, architectural beauty. These and other advantages are a challenge to creative designers.

LESCHEN WIRE ROPE DIVISION **PORTER** ***H. K. PORTER COMPANY, INC.***

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

Obituaries

Laurence Francis Rooney, 64, board chairman of Manhattan Construction Co., Tulsa, while vacationing in Florida. His family construction firm expanded greatly during World War II when it constructed Camps Gruber and Chafee, Lowery Field, and the Army Ordnance Depot at Savannah, Ill. During and since the war the firm has also built the Douglas Aircraft plant and the First National Bank building in Tulsa, an office building for the Continental Oil Co. and the Texas National Bank in Houston and the Phillips Petroleum Company's butadiene plant at Borger Texas.

Charles Crane, a former member of the architectural concern of Henry C. Pelton and an associate of the late Gamble Rogers in New York. Mr. Crane was one of the architects of the Riverside Church in New York and had worked on 23 hospitals and health centers throughout the country.

John S. Longwell, 72, retired chief engineer and general manager of the East Bay Municipal Utility District in Oakland, Calif. Mr. Longwell was a past national director of the American Water Works Association.

Otto H. Hall, 55, Colorado chief of public works. Before going to Colorado, Mr. Hall served with the Michigan Game and Fish Department as well as the Michigan Highway Department.

George H. Cheek, 58, Kentucky highway contractor and a past director of the Kentucky Association of Highway Contractors.

Robert L. Cashen, 56, administrative vice president of the H. K. Ferguson Co., a Cleveland firm of engineers and builders. Mr. Cashen joined the company in 1946 as assistant to the general manager and had been in charge of many large building programs.

Wills Machlachlan, 74, retired consulting engineer of Maples, Ont. Mr. Machlachlan has headed the employee relations department for the Hydro-Electric Power Commission of Ontario and was general chairman of the American Society of Safety Engineers, National Safety Council. His research into the effects of electric shock on human beings was widely published.

Richard T. Jeffery, 80, retired municipal engineer and consultant for the Hydro-Electric Power Commission of Ontario.

How Lincoln, Ill., sewage plant **SOLVED**

HEAVY GREASE LOAD PROBLEM

with one Dorrco Vacuator®

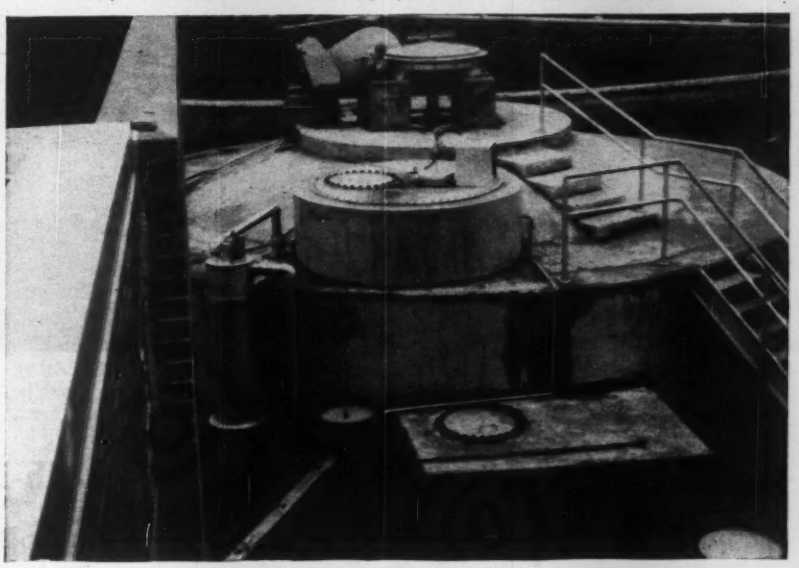
A large institution's decision to grind all its garbage threw a monkey wrench into Lincoln's plans for improving its sewage treatment plant. The institution was already a heavy grease contributor. Increased strength of the sewage would be tremendous. Calculations showed that Lincoln must be prepared to handle wastes equal to those of a town double its size!

Could the town alter its plans, handle the heavier loads and do it efficiently and economically?

It did — with the help of Dorr-Oliver equipment. In one major move a 26′ dia. Dorrco Vacuator was installed for primary treatment and the original settling tanks became intermediate tanks. In the first year of operation, BOD removal through the Vacuator ranged from 19 to 27% — averaging 22%. Suspended solids removed averaged 34%. Not only that, the Dorrco Vacuator proved it could reduce digester requirements by pumping thick sludge averaging 3.6% in solids content to the digester. In short, the Dorrco Vacuator was a vital factor in solving Lincoln's problems — for years to come.

Complete information on the Dorrco Vacuator is readily available. Ask for Bulletin No. 6301. Or write for details on the complete line of Dorr-Oliver equipment for sewage treatment.

Plant Superintendent: Lawrence Arthur. Consulting Engineers: Crawford, Murphy & Tilly, Springfield, Illinois.



DORR-OLIVER

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

NO POWER NEEDED for these Sound Powered

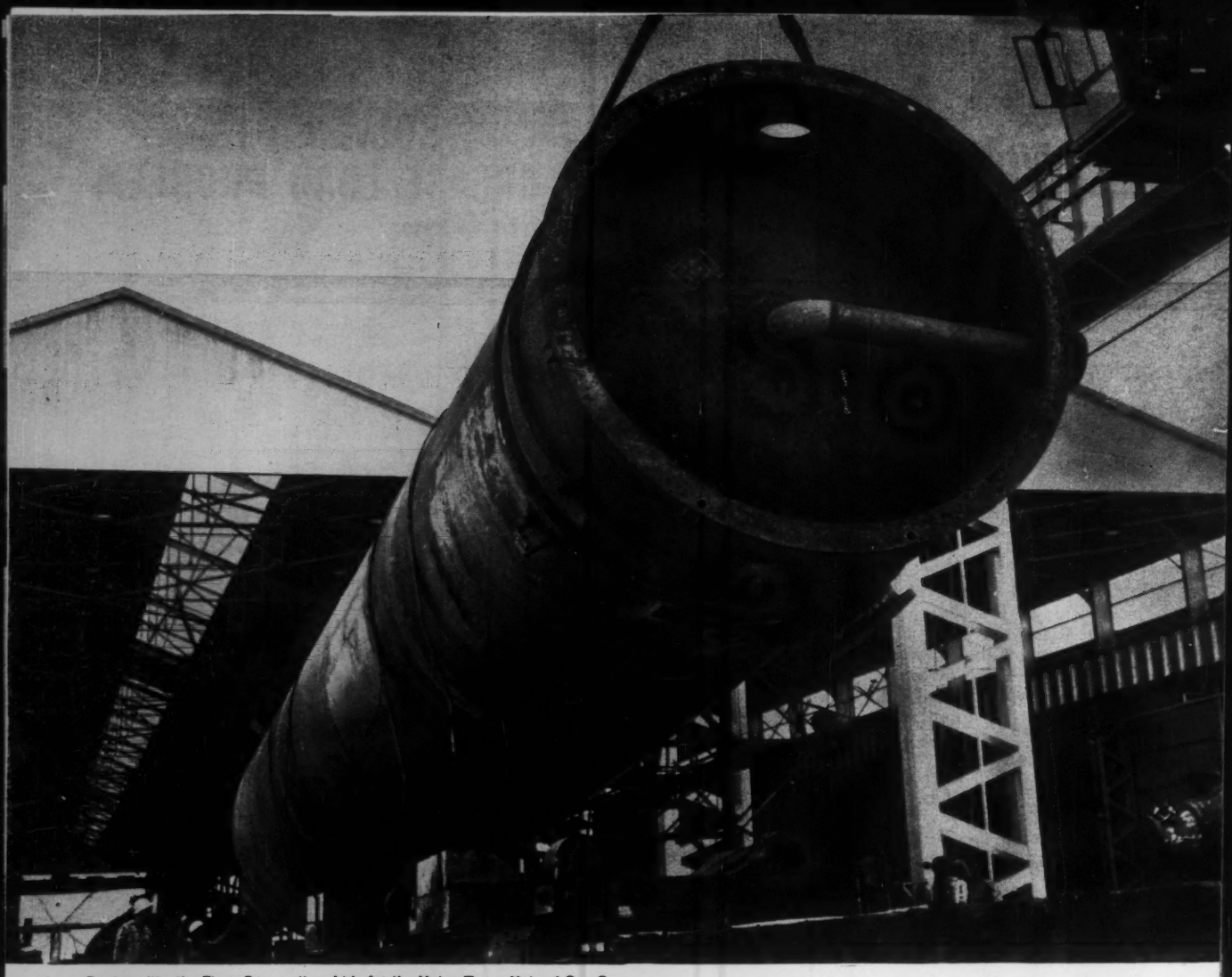
TELEPHONES

They operate in any emergency over a distance of many miles. Can be moved with the job as it progresses or serve permanently. Indoor and outdoor models. Selective ringing, common talking.

Write for catalog

HOSE-McCANN TELEPHONE CO., INC.

25TH ST. & 3RD AVENUE. BROOKLYN 32, N. Y.



Designed by the Fluor Corporation, Ltd., for the Union Texas Natural Gas Corp.

It took a stork's big brother to deliver this 225-ton baby

High-capacity cranes were needed to handle this giant absorber unit (225 tons, 56′ long, 4″ shell), that required special attention and equipment all along the way. First, it was made of ASTM A212 Grade B Firebox Quality Plate, charpy impact-tested to 15 ft. lbs. @ —50°F. Then it was flame cut and roll formed. Its main stem was 100% radiographed, and its nozzle penetration was magnetic-particle inspected. The entire vessel was then stress relieved at 1150°F. for four hours. And finally, it was placed on special flat cars for delivery. ☐ This kind of job demands the complete, modern, high-capacity facilities that permit our Orange, Texas plate shop to handle all kinds of custom plate work. High-capacity cranes, mammoth car bottom furnaces, giant presses and bending rolls, the latest in welding equipment, and complete inspection facilities. This plus know-how and strategic location permit us to produce all kinds of plate work efficiently and economically. And anything we make, we can erect.

Write for our booklet on plate fabricating facilities and services.

USS is a registered trademark

General Offices: 525 William Penn Place, Pittsburgh, Pa.
Contracting Offices in: Ambridge • Atlanta • Baltimore • Birmingham • Boston • Chicago • Cincinnati Cleveland • Dallas • Denver • Detroit • Elmira • Gary • Harrisburg, Pa. • Houston • Los Angeles Memphis • Minneapolis • New York • Orange, Texas • Philadelphia • Pittsburgh • Portland, Ore. Roanoke • St. Louis • San Francisco • Trenton • United States Steel Export Company, New York

American Bridge Division of United States Steel

USS

Concrete bids compared with steel for . . .

Overpass in Dallas, Texas

Bids were taken two ways on the Peavy Road Overpass in Dallas, a four-span bridge with a 15-ft 5-in. vertical clearance over Bruckner Blvd., a heavily travelled, six-lane divided road designated as State Highway Loop 12. Chappell & Brenneke, Dallas, is the consultant.

All seven competing bidders priced the base bid precast concrete beam structure. Only two priced the structural steel beam alternate. The award at $86,787, to Texas Bitulithic Co., Dallas, was on the base bid concrete, and breaks down like this:

	Amount	% under Engr. Est.
Bridge items	$79,344	7%
Connecting street revisions at one end of bridge	7,443	Not known
Total award	$86,787	

The prestressed award was 11.6% under the $98,180 steel beam alternate low bid by Austin Bridge Co., Dallas, and 15% under the bid from Texas Bitulithic—the only other bid.

Spans are two at 50 ft and two 35 ft. There are two approaches. Bridge is 197.5 ft long between service roadway curbs, has a roadway width of 48 ft, and two 4-ft walks. Substructure is drilled piers on limestone, about 7 ft below lower roadway. Bridge cost averages $7.05 a sq ft.

Prevailing wages for semi-skilled laborers is $1.75, and for common laborers a minimum of $1.00.

The bidding on this overpass included:

Base Bid Precast Concrete

1C Texas Bitulithic Co., Dallas	$86,787
2 Austin Bridge Co., Dallas	88,718
7 Oldt Constr. Co., Dallas	113,102
EE Chappell & Brenneke, Dallas	85,378*

Alternate Steel Beams

1 Austin Bridge Co., Dallas	$98,180
2 Texas Bitulithic Co., Dallas	101,986
EE Chappell & Brenneke, Dallas	95,460*

* Overpass only

Bids: 12-7-59 Items	Unit	Quantity	Unit Prices 1C	2
Excavation, uncl street	cy	600	$0.80	$0.85
Concrete pavement, remove	sy	340	1.00	1.00
curb, remove	lf	947	0.50	0.55
pavement, 6", 3000#	sy	1,400	3.88	3.87
curb, std, 3000#	lf	802	0.35	0.40
Inlet, 48" std or var depth	ea	1	165.00	200.00
RC culv pipe, 15", Cl III	lf	68	4.00	7.50
Excavation, uncl structural	cy	194	5.50	7.00
Reinf conc drilled piers, 18"ϕ	lf	291	8.00	6.25
20"ϕ	lf	177	9.00	7.45
30"ϕ	lf	138	18.00	16.60
Structural concrete	cy	6,553	49.00	42.00
Reinforcing steel	lb	115,631	0.11	0.113
Aluminum handrail	lf	396	16.00	17.15
Reinf conc riprap	sy	533	3.80	5.10
Precast concrete beams, 34" depth	lf	524.25	12.00	16.60
40" depth	lf	885	14.00	17.30
Alternate Steel Beams				
Add: structural steel	lb	232,372	$0.162	$0.161
reinf conc drilled piers, 18"ϕ	lf	3	8.00	6.25
20"ϕ	lf	3	9.00	7.45
Deduct: structural concrete	cy	29.1	110.00	115.00
reinforcing steel	lb	5586	0.11	0.113

Completion schedule: 90 working days

Pedestrian Bridge Will Cost $23 per Sq Ft

At an average cost of $22.88 per sq ft, a steel span suspension bridge, 120 ft long and 5 ft wide, will provide a pedestrian crossing over the left fork of the Pocatalico River near Goldtown, Jackson County, W. Va. Work is for the West Virginia State Road Commission, Charleston. George Brooks is district engineer of the commission at Parkersburg.

The award at $13,728 to W. R. Orders & Son, St. Albans, W. Va., is 6.4% over the engineers estimate, but it is less than 2% under the second and 3% under the third low of the eight bids.

Minimum wages include: reinforcing and structural steel workers, $3.50; carpenters, $3.55; crane, power shovel, derrick and dragline operators, $3.65; bulldozer operators, $3.20; common laborers, $2.55.

The bidding on this pedestrian bridge included:

1C W. R. Orders & Son, St. Albans, W. Va.	$13,729
2 Walter C. Stonestreet, Fairmont, W. Va.	13,981
8 David Goldberg & Son, Uniontown, Pa.	25,222
EE Geo. Brooks, District Engr. State Road Comm., Parkersburg, W. Va.	12,900

Bids: 2-18-60 Items	Unit	Quantity	Unit Prices 1C	2
Excavation, structural	cy	131	$3.50	$6.00
Cr stn base course matl	t	26	6.30	10.00
Steel bearing piles	cy	120	11.70	15.00
Conc, cl A, substructure	cy	40	60.00	70.00
Steel, reinforcing	lb	2,322	0.16	0.25
Steel superstructure (8,125#)	ls	job	7,000	5,500
Treated lumber & timber	Mbm	2.2	340.00	400.00
Rock fill, special	cy	399	3.00	3.50

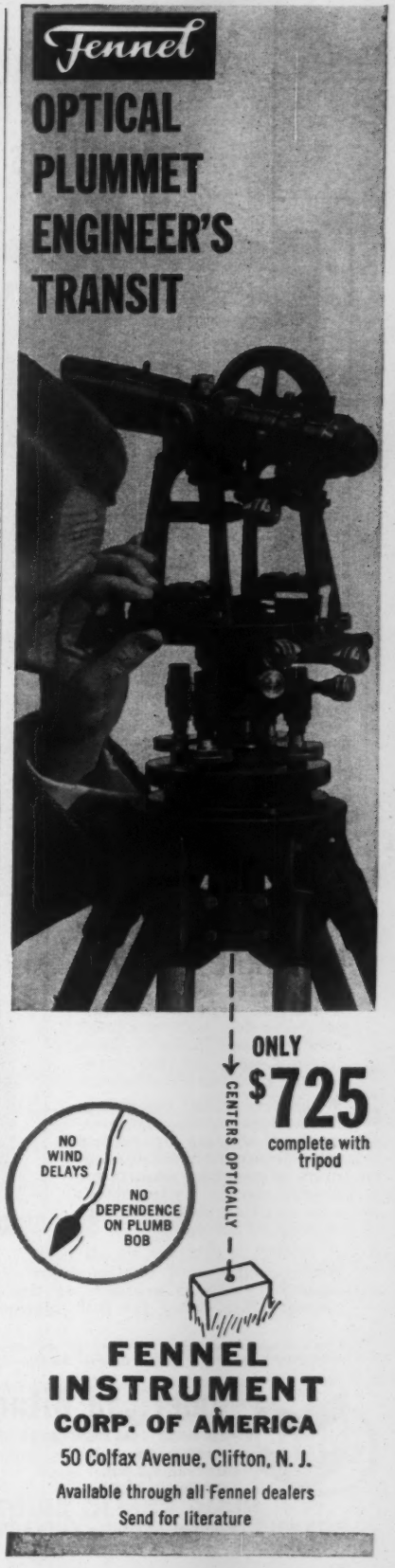
Completion schedule: 75 working days

Kentucky Highway Prices

Average Unit Bid Prices on Selected Items, 1958-1959

Items	Unit	Avg. Unit Price *1958	**1959
Grad aggr base, limestone plt mix	t	$3.399	$3.89
Limestone, cr, for base & insul	t	3.557	3.93
traf bd mac	t	3.169	2.97
entrances	t	3.467	3.71
reshap-compact	t	3.388	3.09
surface mix	t	4.050	3.86
binder mix	t	4.275	4.20
M patch	t	4.740	4.09
Bank gravel base	t	1.828	1.90
River or creek gravel, TBS	t	1.205	1.00

(Unit Prices continued on p. 86)



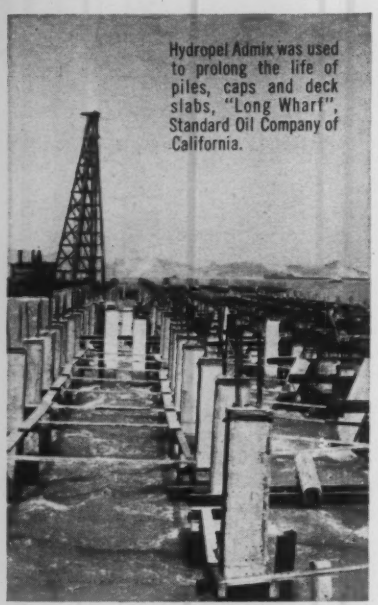
These Laykold® Products
ASPHALT SPECIALTIES

Keep Walls and Slabs DRY!

Laykold Waterproofing is spray applied to concrete foundation wall of major structure in the Kaiser Center, Oakland, California.

LAYKOLD WATERPROOFING...

for fast, economical "first-line" protection. Laykold® Waterproofing* is a specially-compounded asphalt emulsion for cold, external application on concrete or masonry walls. Put on by brush or spray ahead of backfills, it provides resistance to moisture and dampness.



Hydropel Admix was used to prolong the life of piles, caps and deck slabs, "Long Wharf", Standard Oil Company of California.

HYDROPEL INTEGRAL ADMIX...

a unique type of asphalt emulsion for waterproofing* concrete used in walls, slabs, footings, etc. for industrial, marine or other construction.

Whenever moist conditions, freeze-thaw cycles, the presence of alkaline or neutral salts require the absolute minimum of moisture absorption, always specify Hydropel®. It cuts capillary water absorption by 80 per cent.

Waterproofing and Hydropel are only two of the famous Laykold line of asphaltic products available to the construction industry. Call or write our nearest office today for full information.

*The limitations of any product to "waterproof" any type of surface for an indefinite length of time are clearly recognized, as covered by the "Trade Practice Rules for the Masonry Industry," outlined 8/31/46 by the Federal Trade Commission.

American Bitumuls & Asphalt Company

320 MARKET, SAN FRANCISCO 20, CALIF.
Perth Amboy, N. J.
Baltimore 3, Md.
Cincinnati 38, Ohio
Atlanta 8, Ga.
Mobile, Ala.
St. Louis 17, Mo.
Tucson, Ariz.
Portland 8, Ore.
Oakland 1, Calif.
Inglewood, Calif.
San Juan 23, P. R.

BITUMULS Emulsified Asphalts • CHEVRON Paving Asphalts • LAYKOLD Asphalt Specialties

. . . Kentucky Highway Prices

Items	Unit	Avg. Unit Price *1958	**1959
Bit conc base, mod limestn, cl 1	t	$ 7.299	$ 7.23
mod cr riv gravel, cl 1	t	7.638	7.73
Limestone aggr, cl 1, base	t	6.488	8.45
binder	t	7.008	7.75
surface	t	7.454	7.36
Riv grav aggr, Cr, cl 1, surface	t	7.122	7.09
M patch, limestn, cl 1 binder	t	8.354	7.72
surface	t	7.204	7.62
Tar—RT 2	gal	0.255	0.25
Asphalt, emulsified, RS-1	gal	0.161	0.18
RS-2	gal	0.187	0.19
AE 200	gal	0.166	0.17
liquid, MC-4	gal	0.164	0.16
Inlet, median box, 15"	ea	219.355	252.06
18"	ea	252.055	253.53
24"	ea	301.143	302.62
dbl, 15"	ea	267.105	295.83
18"	ea	314.286	373.08
lip curb box	ea	296.774	285.81
curb & gutter, type A	ea	386.522	389.61
roll curb box, type A	ea	382.286	405.19
type B	ea	283.330	566.67
valley gutter box	ea	257.237	180.00
Ditch catch basin	ea	258.929	208.89
MH frame, adjust to grade	ea	37.768	40.47
& cover	ea	56.250	75.63
Manhole	ea	395.759	428.75
Curb & gutter	lf	3.618	3.87
Roll integral curb	lf	0.771	1.09
Integral curb	lf	0.879	1.00
Bronze expansion plate	lb	1.079	1.05
Handrail, aluminum	lf	7.126	6.20
galv pipe	lf	8.308	8.62
Lumber, creosoted	Mbm	297.538	375.49
Metal plank	sf	2.257	2.70
Piling, 14" RC, furn	lf	6.048	5.04
drive	lf	5.698	4.87
16" RC, furn	lf	6.127	8.00
drive	lf	5.051	7.11
12" steel, furn	lf	4.017	5.03
drive	lf	2.960	3.67
Steel reinforcing	lb	0.136	0.13
structural	lb	0.232	0.25
Conc masonry, remov	cy	11.297	13.01
RC entr pipe, cl III, 15"	lf	3.670	3.66
18"	lf	4.556	4.73
BCCM, 16 ga entr pipe, 15"	lf	3.977	3.91
18"	lf	4.773	4.75
RC culv pipe, Cl III, 15"	lf	4.229	3.96
18"	lf	5.043	5.08
24"	lf	6.989	6.68
BCCM culv pipe, 16 ga, 18"	lf	5.260	5.21
14 ga, 24"	lf	7.177	7.22
pipe arch, 16 ga, 22x13"	lf	6.693	5.43
VCP, std str perforated, 6"	lf	2.158	2.50
Conc pipe, perforated, plain 8"	lf	2.000	3.24
sewer pipe, plain 8"	lf	3.117	1.74
Base cement concrete	sy	5.275	6.67
Calcium chloride	t	69.409	73.14
Clear & grub	ac	167.227	157.96
Concrete, class A	cy	61.818	57.47
class B	cy	55.547	59.59
class D	cy	214.562	219.56
Ditch paved	sy	6.140	5.79
Surface ditch, 1 sf area	lf	0.614	0.31
2 sf area	lf	0.346	0.35
Excavation, roadway	cy	0.658	0.57
borrow	cy	0.739	0.58
structural, common	cy	6.134	6.35
solid rock	cy	12.262	12.68
uncl	cy	5.375	4.74
Fence, chain link	lf	3.767	2.11
right of way	lf	0.627	0.66
Fertilizer, 12-12-12 gran com	t	93.180	91.73
Final dressing	100sta	34.519	29.49
Guard rail steel beam	lf	2.889	2.90
post timber	ea	6.122	6.91
Median, 4' conc	lf	4.148	3.78
Overhaul	yd sta	0.014	0.01
Pavement, cement concrete	sy	5.595	6.27
Project monument	ea	38.586	37.62
Reshape & compact	100 ft	19.007	14.69
Riprap dry cyclopean store	sy	7.018	6.92
Right of way markers	ea	7.622	8.03
Scarify & reshape	sy	0.047	0.20
Sidewalk, conc, 4"	sy	4.221	4.40
S1 prot-std conc sl wall	sy	6.841	6.47
dry riprap sl wall	sy	6.861	5.87
Trees or stumps, remove	ea	37.240	58.23
Wall conc crib	sf	6.078	5.00
metal crib	sf	5.467	5.80
Water	Mgal	1.517	1.44
Seed & protect method 3	sy	0.066	0.07
method 1	sy	0.114	0.13
Sodding	sy	0.714	0.66

*Low bidders
**Successful bidders

1949/51 prices, ENR, 4- 3-52 | 1952 prices, ENR, 4-2-53
1953/54 prices, ENR, 3-24-55 | 1954-55 prices, ENR, 2-9-56
1956/57 prices, ENR, 6-19-58 | 1958 prices, ENR, 6-18-59

New rear dump hauls 15% more payload — *built entirely from USS "T-1" Steel.* This Athey PR 619 T-line trailer hauls 25 tons but weighs only 19,260 pounds. One man can move more tons of material, less fuel is consumed when running empty, and the machine has a faster cycle. The big improvement in performance starts with the use of USS "T-1" Steel *throughout*. This "strong boy" of metals cuts dead weight, substitutes 15% extra payload. Tougher, it defies relentless abuse, adds life. USS "T-1" Constructional Alloy Steel has a minimum yield strength of 100,000 psi. It is weldable and has high resistance to impact abrasion and corrosion. What's more, it retains its toughness at temperatures even down to 50 below zero. This combination of properties permits design for maximum weight savings coupled with ability to take abuse. In addition to "T-1" Steel, United States Steel makes other brands of steels for a wide variety of applications: USS COR-TEN, USS MAN-TEN and USS TRI-TEN with a 50,000 psi minimum yield point, in addition to a complete range of carbon and stainless steels.

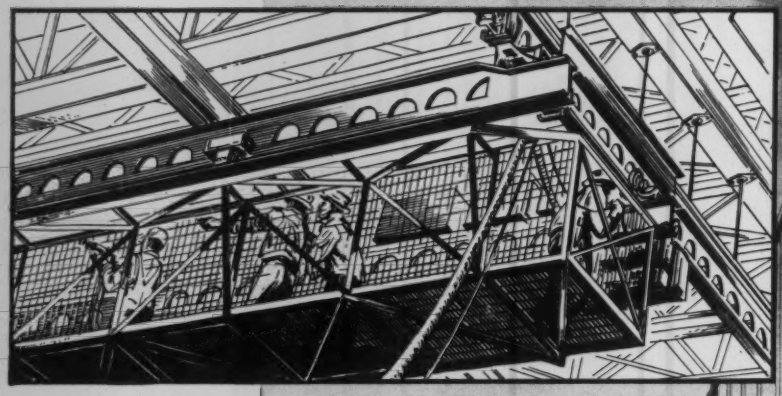
USS, "T-1", COR-TEN, MAN-TEN and TRI-TEN are registered trademarks

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
National Tube—Pittsburgh
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

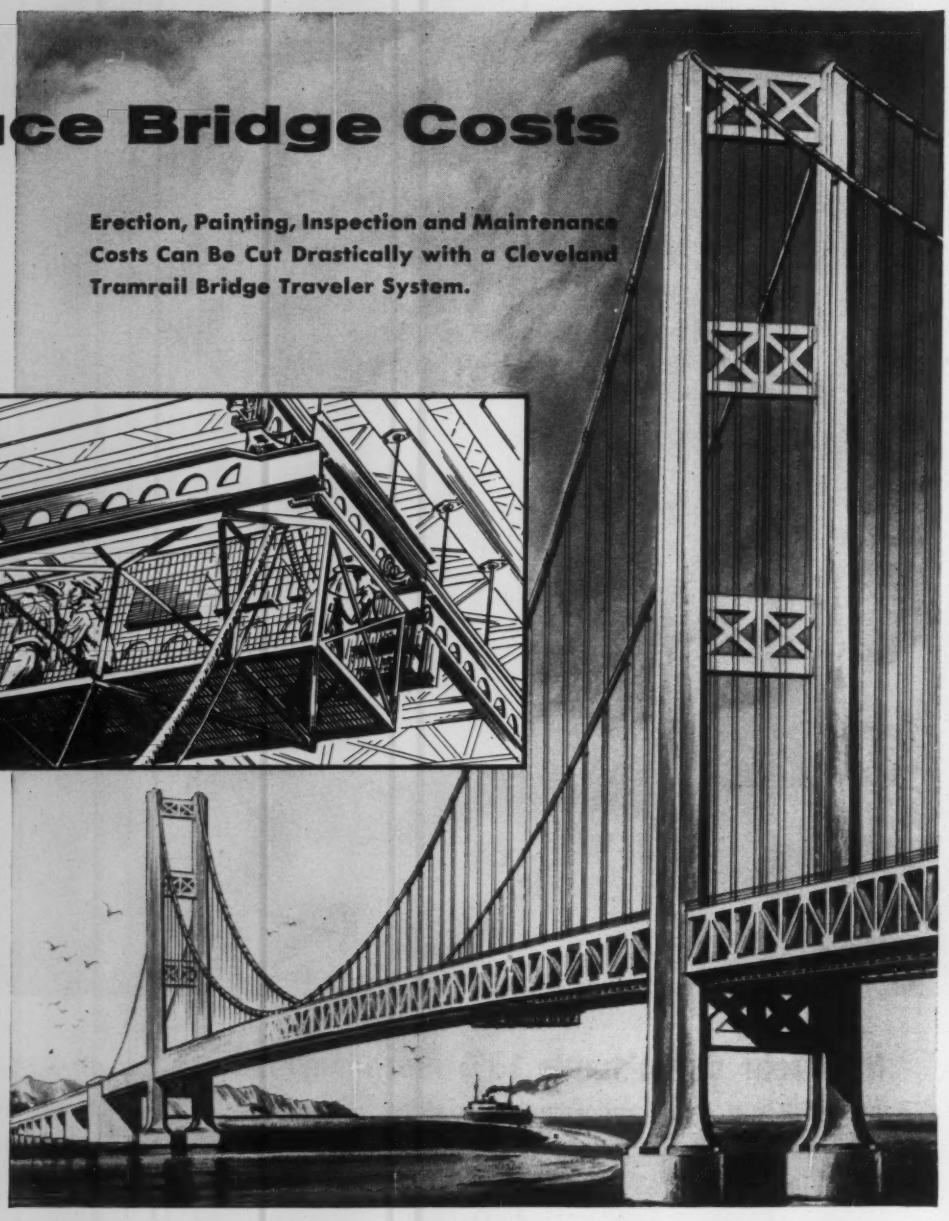
United States Steel

Reduce Bridge Costs

Erection, Painting, Inspection and Maintenance Costs Can Be Cut Drastically with a Cleveland Tramrail Bridge Traveler System.



Cleveland Tramrail Bridge Traveler Systems for manual or electric operation are available for bridges of every type. Travelers may be fitted with sand-blast, paint-spraying and other equipment. For situations where the pier arrangement prevents standard traveler from reaching areas between, Cleveland Tramrail has developed a retractible type traveler.



WHAT are you doing to cut bridge erection costs? What are you doing to simplify inspection? What are you doing about reducing maintenance costs?

You can make sizeable savings in these areas and aid safety by installing a Cleveland Tramrail Bridge Traveler system on a bridge during the early stage of construction.

The equipment operates on tracks suspended below the bridge deck. It can be quickly traveled to any point underneath a bridge. No time or effort need be spent erecting scaffolding or on other means, for a Cleveland Tramrail carrier will deliver men, equipment and materials wherever required. If necessary, it can also be designed to provide easy access to the sides of a bridge.

Your inquiry is invited.

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 5539 E. 290 ST. • WICKLIFFE, OHIO

Materials Prices

Monthly Market Quotations by ENR Field Reporters

IRON AND STEEL PRODUCTS — PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES—	PLATE CARBON STEEL	REINF BARS* billet	RIVETS ½-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$5.50	$5.30	$5.675	$12.25	.....	$110.50	$130.00	$6.975	$9.75	$6.60	.....
Chicago Area	5.50	5.30	5.675	12.25	$6.50	110.50	130.00	6.975	9.75	6.60	.....
Pittsburgh Area	5.50	5.30	5.675	12.25	6.50	110.50	130.00	6.975	9.75	6.60	$14.75
Buffalo Area	5.50	5.30	5.675	12.25	6.50	110.50	130.00	6.975	9.75	6.60	14.75
Cleveland	.....	.....	5.675	12.25	6.50	.....	.....	.....	.....	.....	14.75
Youngstown Area	.....	.....	5.675	.....	.....	.....	.....	.....	9.75	.....	.....
Geneva	5.50	5.30	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	6.20	.....	6.375	.....	6.50	.....	.....	.....	9.75	6.875	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	69.75	9.75	6.60	.....

* Fairless Works, $5.575.

IRON AND STEEL PRODUCTS — F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	Extras W	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot New billet	REINFORCING BARS Rail steel	Extras, New York:	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh. 3.4 lb.	EXPANDED METAL LATH Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill
Atlanta	7.29–8.29*EvV*		8.75	$8.75		$53.00*S*	$57.00*S*	
Baltimore	9.70		9.00*T*			44.50	49.00	
Birmingham	9.00*ty*		8.51–9.94*tyV*	8.51–9.94*ty*		61.00*pK*	67.00*pK*	
Boston	8.21–9.31*FxsV*		8.75*t*	8.75*t*		49.50*K*	54.00*K*	
Chicago	7.31–7.86*ysV*		7.00–7.10*yuV*	7.00–7.10*yuV*		52.00‡*U*	63.00‡*U*	
Cincinnati	7.87–8.42*tkysV*		8.16‡	....		44.50*Kg*	49.00*mnKg*	
Cleveland	7.74–8.29*ysV*		7.14*ct*	....		46.50*KL*	51.00*KL*	
Dallas	7.71–9.49*MtsV*		9.00	9.00		44.00*u*	48.50*w*	
Denver	10.16*cK*		9.25*e*	....		63.00*n*	69.00*n*	
Detroit	7.87–8.57*RMsVy*		7.37*Q*	11.85*Q*		67.00*O*	74.00*O*	
Kansas City	8?*sT*		8.10*N*	....		51.00	55.00	
Los Angeles #	8.90–9.55*dktsV*		7.35*frt*	....		55.00*S*	64.00*S*	
Minneapolis	7.78–8.17*ysV*		9.26*T*	9.26*T*		44.50*K*	49.00*K*	
Montreal	7.90–8.80*tCF*/8.20–8.90*AsF*		7.00/7.50*FGi*	7.00/7.50*FGi*		65.70*k*	70.20*k*	
New Orleans	....		8.00*pktz*	....		48.50*K*	53.50*K*	
New York	8.02–8.84*Vzs*		8.60*ty*	8.60*y*		52.00*n*	59.00*m*	
Philadelphia	7.85–8.40*tuyzsV*		8.23*uy*	8.23*y*		44.50‡*U*	55.20‡*U*	
Pittsburgh	7.35–7.90*ysV*		7.35*y*	....		58.50‡*rw*	64.50‡*rw*	
St. Louis	7.79–8.34*stzyV*		7.75‡*tzQ*	7.75‡*tzQ*		61.00*rzK*	62.00*rzK*	
San Francisco	9.45*tsV*		9.85*jS*	....		53.00*S*	58.00*S*	
Seattle	9.45–10.25*aDsV*		8.85*DM*	....		67.00‡*nD*	73.50‡*nD*	
Toronto	9.20*H*		7.85	7.85		44.00*pJ*	38.40*qJ*	

Quantity extras per cwt: Item; 10,000# and over, base; 5,000—9,999#, +10¢, 2,000—4,999#, +35¢, 1,000—1,999#, +85¢, 400—999#, +$1.75, 300—399#, +$3.00, under 100#, +$4.00. Order; 20,000# & up, none. Size†; 40,000# & up, none. ◆Size†; #2 +$2.50; #3 +$1.40; #4 +$1.00; #5 +70¢; #6, #7, #8, #9, #10, #11 +50¢. ◆Bending; heavy, +90¢; light +$2.20 (except in New York City and surrounding metropolitan area where bending must be done on the job). ◆Engineering (details and placing from designs by others); over 500 tons, +15¢; 200–499 tons, +50¢ but not over $4500; 75–199 tons, +85¢ but not over $2000; 20–74 tons, +75‡ but not over $975; 5–19 tons, +85‡ but not over $300; under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only; +60¢.

EXTRAS, per cwt—◆Quantity (applies to LCL shipments only): under 1,000#, +$1.80; 1000–1999#, +$1.50; 2000–4999#, +$1.20; 5000–9999#, +90¢; 10,000–19,999#, +60¢; 20,000–29,999#, +30¢; 30,000–39,999#, +10¢; 40,000# & up, none. ◆Size†: #2 +$2.50; #3 +$1.40; #4 +$1.00; #5 +70¢; #6, #7, #8, #9, #10, #11 +50¢. ◆Bending; heavy, +90¢; light +$2.20 (except in New York City and surrounding metropolitan area where bending must be done on the job). ◆Engineering (details and placing from designs by others); over 500 tons, +15¢; 200–499 tons, +50¢ but not over $4500; 75–199 tons, +85¢ but not over $2000; 20–74 tons, +75‡ but not over $975; 5–19 tons, +85‡ but not over $300; under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only; +60¢.

WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill	
4 × 18 In., No. 5 & 10 wires —	
Joliet, Ill., Donora, Pa., Monessen, Pa.	$7.04
4 × 12 In., No. 8 & 12 wires —	
Joliet, Ill., Donora, Pa., Monessen, Pa.	$3.62
6 × 6 In., No. 6 & 6 wires —	
Joliet, Ill., Donora, Pa., Monessen, Pa.	$4.17

◆‡ Delivered ◆* Aver. of Canadian & American ◆# add 4% sales tax ◆a 2000–4999# ◆b 10,000–19,999#, fob city ◆c 20 tons or over ◆d 10,000–29,999# ◆e Intermediate struct'l ◆f Incl. delivery in free zone ◆g CL ◆h list price; dominion tax exempt; add provincial and municipal sales taxes ◆i add provincial and municipal sales taxes ◆l intermediate and hard grade ◆k fob city ◆l delivered; contractor to do unloading ◆m copper alloy ◆n LCL ◆o asphalt coated ◆p 500 sq. yd. or more. ◆q 2.5 lb ◆r less 2% disc. for cash ◆s 10,000# item in 20,000# order ◆t less ½% disc. 10 days ◆u add 10¢ switch ◆v incl 15¢ del. ◆w truck lots. ◆x add 2% sales tax ◆y add 15¢ del. ◆z add 10¢ del. ◆A American made. ◆C Canadian made. ◆D ½% for cash. ◆E 30,000# or over. ◆F Federal tax exempt for bldgs. ◆G add 10¢ del. ◆H 8.85 without tariff charges. ◆I 3 lb $60.00. ◆J 4 lb $47.50. ◆K less 2% disc. 10 days ◆L F.o.b. Youngstown plant ◆M 5,000–9,999# ◆N 2,000–19,999# ◆O 100 sv lots ◆O 5 tons to CL ◆R: revised ◆S less 2% disc. 10th ◆T less ½% disc, 10th of mo. ◆U less 2% disc 10 days ◆V varies according to type and size ◆W Chicago, Cincinnati, Cleveland, Dallas, Detroit, New York, Philadelphia, St. Louis, and Pittsburgh.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEX*a*	ASBESTOS CEMENT PIPE Z per lin. ft. 6" Press Cl. 150	ASBESTOS CEMENT PIPE Z per lin. ft. 12" Sew Cl. 1500	CLAY SEWER PIPE Per ft., delivered, car load ASTMC 13-55 8 in.	12 in.	ASTMC 200-55T 24 in.	36 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTMC 4-55 6 in.	8 in.	CONCRETE SEWER PIPE*b* Per ft., delivered ASTMC 14-55 12 in.	24 in.
Atlanta	130.5	$1.61/1.69	$2.36/2.48	$0.55*r*	$1.04*r*	$4.50*r*	$12.60*r*	$209.00*mr*	$334.00*r*	$0.95*m Kr*	$3.75*m Kr*
Baltimore	140.1	1.61/1.69	2.19/2.30	.665	1.20	3.05	12.71	187.80	289.20	1.61	2.75
Birmingham	125.8	1.61/1.69	2.26/2.37	.50*r*	.95*r*	4.14*rw*	13.50*rw*	295.00*rz*	430.00*rz*	1.75*rS*	2.75*rS*
Boston	143.1	1.63/1.71	2.19/2.30	.784*qrtL*	1.512*qrtL*	6.255*qrtM*	.....	215.40*r*	330.60*r*	1.56*S*	3.47*S*
Chicago	139.8	1.61/1.69	2.19/2.30	.93*rm*	1.78*rm*	7.52*rm*	21.16*rm*	220.00*Br*	330.00*Br*	1.30	4.00
Cincinnati	135.5	1.63/1.71	2.19/2.30	.616*rt*	1.188*rt*	4.725*rt*	12.40*r*	270.00*r*	400.00*r*	.85*rAB*	3.25*rAB*
Cleveland	141.6	1.63/1.71	2.19/2.30	.60*BCN*	1.15*BC*	7.78*BC*	24.15*BC*	167.40*mBC*	258.60*mBC*	1.35	3.60*P*
Dallas	137.8	1.63/1.71	2.26/2.37	.550‡*B*	.96‡*B*	4.40‡*B*	9.75‡*bB*	.....	.....	1.25*BD*	2.85*BD*
Denver	144.9	1.71/1.80	2.36/2.48	.56*nr*	1.00*nr*	4.98*r*	.....	460.00*nr*	640.00*nr*	1.05*m*	3.50*m*
Detroit	141.9	1.61/1.71	2.19/2.30	.97*mk*	1.86*mk*	7.48*mk*	19.95*mk*	212.00*mk*	327.00*mk*	1.40*k*	5.23*k*
Kansas City	138.5	1.61/1.71	2.26/2.37	.62*r*	1.125*r*	6.324*br*	16.86*r*	315.00*r*	625.00*r*	1.60*r*	3.55*r*
Los Angeles #	148.6	1.70/1.79	2.19/2.30	.825*l*	1.78*blS*	7.19*blS*	16.90*blS*	410.00*lS*	590.00*lS*	1.24*qE*	3.66*fqE*
Minneapolis	144.8	1.67/1.75	2.26/2.37	1.00*oB*	1.80*oB*	7.75*oB*	.....	.....	.....	2.19*DFH*	6.31*DFH*
Montreal	.....	.....	.....	1.13*u*	2.00*u*	7.00*u*	13.50*u*	288.00	545.00	1.17*D*	3.11*fpD*
New Orleans	132.3	1.61/1.69	2.26/2.37	.56*tr*	1.078*r*	5.65*r*	.....	240.50*pr*	490.00	1.41*tlR*	3.76*tl*
New York	138.5	1.63/1.71	2.19/2.30	1.01	1.94*R*	12.89	35.61	240.81	369.84	1.50‡*B*	3.60‡*B*
Philadelphia	137.8	1.61/1.69	2.19/2.30	.72‡	1.40‡	9.02‡*r*	24.68‡*r*	220.00‡	330.00‡	1.50‡*h*	4.00‡*h*
Pittsburgh	142.7	1.63/1.71	2.19/2.30	.94*K*	2.01*K*	8.79*K*	24.15*K*	190.00	295.00	1.66*Db*	3.93*DB*
St. Louis *O*	136.9	1.61/1.69	2.26/2.37	.65*r*	1.27*r*	5.10*r*	12.95*rS*	200.00*r*	350.00*r*	1.75*i*	4.05
San Francisco	148.6	1.70/1.79	2.19/2.30	.86‡*d*	1.86‡*d*	7.53‡*d*	18.00‡*d*	360.00‡*l*	620.00‡	1.05‡*Q*	3.30‡*Q*
Seattle	149.0	1.71/1.80	2.19/2.30	.88*bk*	1.86*kb*	7.61*k*	.....	260.00*ck*	.....	1.95*ky*	4.55*ky*
Toronto	.....	.....	.....	.80*F*	1.50*F*	6.00*F*	.....	185.00*F*	305.00*F*	1.27*F*	5.19*F*

*WROUGHT STEEL PIPE

(Full standard weight)

Discount from list; see footnote

Mill	2½ & 3 in. Butt Weld* Black %	2½ & 3 in. Butt Weld* Galv. %	3½ to 6 in. Lap Weld* Black %	3½ to 6 in. Lap Weld* Galv. %
Lorain, Ohio	13.75	+3.50	.....	.....
Aliquippa, Pa	13.75	+3.50	.....	+14.50*a*
Sparrows Pt., Md	17.25	+Last	.....	+15.50*a*
Benwood, W. Va	13.75	+3.50	3.25	+14.50*a*
Youngstown, O	13.75	+3.50	2.25*ab*	+15.50*a*
Indiana Harbor, Ind.	12.75	+4.50	.....	.....
Sharon, Pa	13.75	+2.50	3.25*ab*	+13.50*ab*
Wheatland, Pa	13.75	+3.50	3.25*a*	+14.50*a*
Etna, Pa	13.75	+3.50	.50*de*	+14.50*e*
Fontana, Calif	0.75	+15.50*b*	+0.75*ab*	+26.50*ab*

* Threaded and coupled. a 3½ to 4 in. b Continuous weld. c: to 1 5 and 6 in. d 6 in. e Seamless 5 in.

*† Extra quality. *‡ delivered. *# add 4% sales tax *a PRICE INDEXES or CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 125.8; Burlington, N. J., 134.6. For explanation of index see ENR Sept. 29, 1955 page 139. *b Extra strength. *c 4-in., $130. *d SS361-A. *f 21 in. *g culvert pipe; reinf., ASTM C 75–56. *h reinf., ASTM C 75–54. *i reinf., ASTM C 76–55. *j centrispun. *k less 2% disc. for cash. *l fob plant. *m truck del. *n LCL del., fob truck. *p less 5% disc. 10th. *q freight allowed to destination in city. *u 35,000# minimum. *r less 2% disc. 10 days. *s 1 ft lengths. *u CSA A 60. *v standard strength. *w SS; add 20% for d.s. *x fob city. *y Reinforced. *z Upper value in range based on both truck lots and less than truck lots, fob city; lower value truck lots delivered. *A single strength. *B truckload. *C less 2% disc. 15th. *D ASTM 76–57. *E less 1% disc. 10 days. *F less 2% disc. 30 days. *G LCL. *H CL. *I fob origin, freight allowed. *J reinf. B14–15. *K Less 2% disc. 15 days. *L ASTM 13–57. *M ASTM 200–57. *N 2 ft lengths. Trucklots. *O add 2% Sales Tax. *P 18 in. *Q less 1% disc. 10th. *S ASTMC 72, 12" 1.55, 24" 4.00.

* WROUGHT STEEL PIPE: Deduct discounts shown above from the following standard list at consumers carload prices to get mill price. List prices per ft.(*based on approx. $200 per net ton): Butt Weld ⅛ in., 8½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 76½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. continuous weld same as lap weld prices Add freight, 3% transport tax for destination price. † Production discontinued November 1957

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld—1 in. black, + 65.54, galv., + 95.77; 1¼ in. black, + 65.54, galv. + 98.23. 1½ in. black, + 67.79 galv. + 91.22; Lap Weld —2½ in. to 3 in. black + 67.95 galv. + 98.77; 4½ in. to 6 in. black + 84.74 galv. + 90.68 Add freight rates plus 3% transportation tax to get destination price.

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last Apr. 21; Next, May 19
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Apr. 28; Next, May 26
- Wage Rates, Building Board, Lath, Insulation: Last, Apr. 28; Next, June 2
- Cement, Aggregate, Ready Mixed Concrete, Asphalt: Last, May 5; Next, June 9

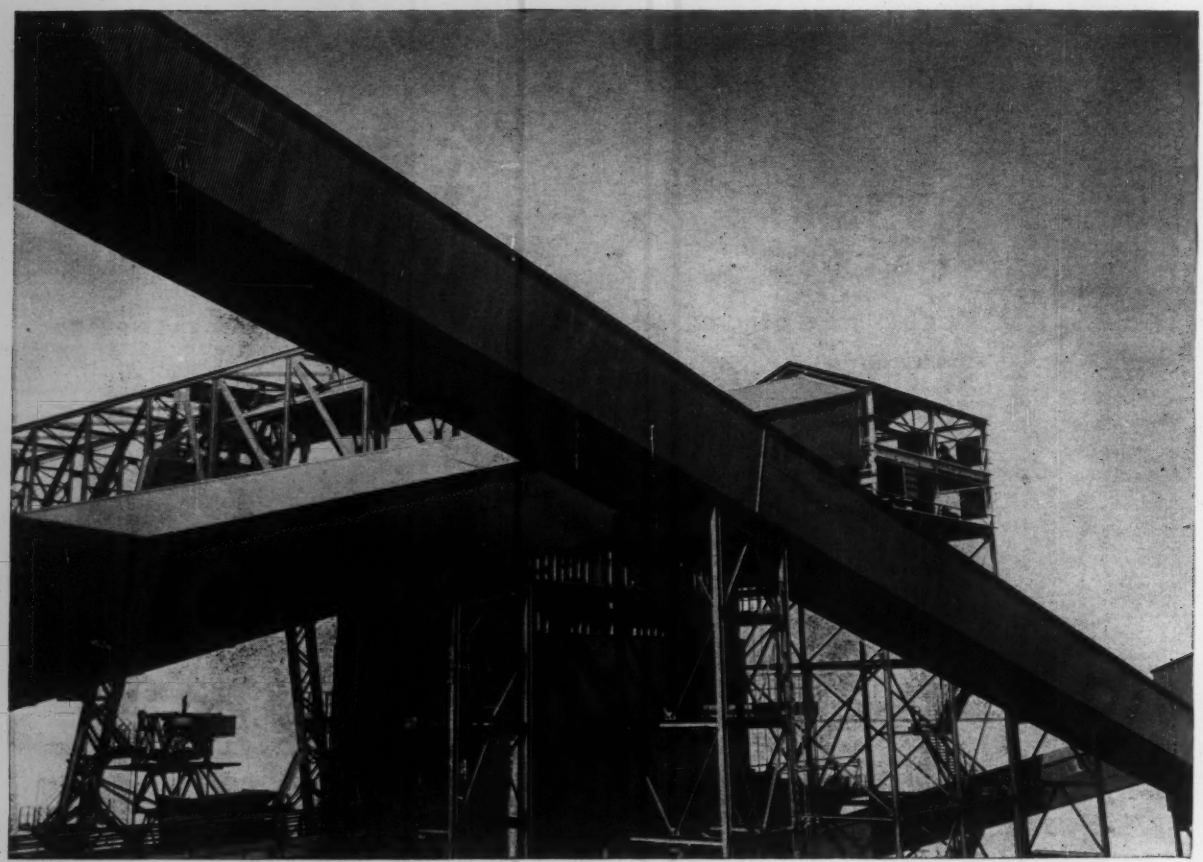
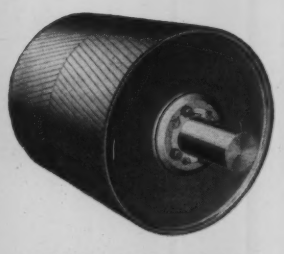
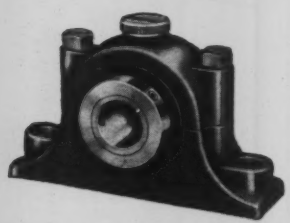


Photo courtesy of McDowell Co., Inc.

Dodge dependability built into new sinter plant conveyor system at Inland Steel



DODGE TAPER-LOCK STEEL CONVEYOR PULLEYS



DODGE DOUBLE INTERLOCK PILLOW BLOCKS WITH TIMKEN BEARINGS

Dodge Taper-Lock Steel Conveyor Pulleys and Dodge Double Interlock Pillow Blocks with Timken Tapered Roller Bearings contribute their dependability to this new sinter plant. They are an important part of the extensive conveyor system engineered by Dwight-Lloyd Division of McDowell Company, Inc., Cleveland.

Maximum strength with minimum weight is provided by these rugged conveyor pulleys. Their steel rims, discs and hubs are fused together into jointless drum construction for terrific impact resistance. With the unsurpassed holding power of Taper-Lock mounting there is no "walking on the shaft."

Dodge Double Interlock Pillow Blocks (with Timken Tapered Roller Bearings) were chosen for this hard service. They are rugged, compact, fully self-aligning—with substantial radial and thrust capacities. The extra long inner race distributes load over a greater shaft area. They are adjusted, lubricated and sealed at the factory—for a long life of dependable service.

DODGE MANUFACTURING CORPORATION, 6900 Union St., Mishawaka, Ind.

DODGE

of Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, MARIE MORAVSIK, ELAINE CHOMYAK, ELIZABETH WERRA, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

▲ **Conn., Wilton**—HOUSE, etc.—BA 5/17—School Sisters of Notre Dame, c/o J. Gerald Phelan, archt., 211 State St., Bridgeport, mother house and novitiate, Belden Hill Rd. $3,000,000. Fletcher-Thompson, Inc., 211 State St., Bridgeport, engr. CD 9/30.

▲ **Mass., Boston**—MOTOR INN—BA 5/17—The Church Realty Trust, 15 Norway St., Boston, (selected list bidders), Midtown Motor Inn, 129 unit motel, 220 Huntington Ave. $1,500,000. Samuel Glaser Assoc., 234 Clarendon St., archts. Goldberg, LeMessurier Assoc., 669 Boylston St., structural engrs. Lessee, c/o John Druker & Son, 50 State St., Boston, Mass. CD 11/11.

HEAVY CONSTRUCTION—LB & CA

▲ **VERMONT**—State Hy. Dpt., State House, Montpelier, **Landers & Griffin, Inc.,** 800 Islington St., Portsmouth, N. H., and **Morrison-Knudsen Co., Inc.,** 150 E. 42 St., New York, N. Y., CA **$2,593,873,** Contr. 1, roads and bridges, Waterbury-Bolton I-89-2(7). Bids Apr. 22, awarded Apr. 26. CD 4/26, under LB.

BUILDINGS—LB & CA

▲ **C. A. Batson Co.,** 26 Arlington St., Brockton, Mass., CA **$1,961,613,** est. $1,850,000, JUNIOR HIGH SCHOOL, River St., BRAINTREE, MASS. Town, 10 Tremont St., Braintree, Mass. Bids Mar. 24, CD 3/29, under LB.

▲ **Daniel O'Connells Sons, Inc.,** 480 Hampden St., Holyoke, Mass., CA **$1,891,124,** HIGH SCHOOL, Wellesley St. and South Ave., WESTON, MASS. Town, School St., Weston, Mass. Bids Apr. 14. CD 4/19, under LB.

▲ **Owner,** c/o Philip Birnbaum, archt., 12 E. 48 St., New York, N. Y., Owner Builds, **$2,449,760,** APARTMENT, Strawberry Hill Ave., STAMFORD, CONN.

▲ **Green Manor Constr. Co., Inc.,** 382 W. Middle Turnpike, Manchester, Conn., CA **$2,000,000,** 2 story, 133,000 sq. ft. SHOPPING CENTER, Corbins Corner, WEST HARTFORD, CONN. Five City Plaza, c/o Frederick W. Conard, Jr., 15 Lewis St., Hartford, Conn. Awarded Apr. 30. CD 7/19/56.

▲ **John Capobianco,** 101 Tremont St., Boston, Mass., CA **$3,698,000,** North SENIOR HIGH SCHOOL, Commercial St., East Weymouth, WEYMOUTH, MASS. Town, 111 Middle St., Weymouth, Mass. Bids Apr. 1. CD 4/6, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **N. Y., Mineola**—BA 5/17—Bd. Supervs. Nassau Co., Old County Court House, sewage treatment plant and lift station, Inwood. $1,412,960. Plans deposit $50. CD 6/3/58.

▲† **D. C., Wash.** — BA 6/16 — U. S. Eng., First and Douglas Sts. N.W., Dalecarlia filter and chemical buildings, CIVENG-49-080-60-1 (19). Plans deposit $10. Extended date. CD 4/27.

BUILDINGS—BA

▲ **N. Y., Huntington**—DEPARTMENT STORE, etc.—BA 5/16—Sears Roebuck & Co., 1601 N. Harlem, Chicago, Ill., 1 story, 93,500 sq. ft., brick, concrete department store and 22,000 sq. ft. service bldg. $2,000,000. Francis X. Gina Assoc., 219 E. 44th St., New York, archts. Syska & Hennessy, Inc., 219 E. 44th St., New York, mechanical engr.

▲ **N. Y., Rochester** — PUBLIC SAFETY — BA 5/24 — Rochester-Monroe Civic Center Comn., Rm. 36, City Hall, general contract, heating and ventilating, plumbing work, electrical work, elevator and escalator, city public safety bldg. for Rochester-Monroe County Civic Center. $7,000,000-$8,000,000. Plans deposit $100. Bohacket & Flynn, 311 Alexander, Zone 4, archts. Charles Sells, 304 E. 45th St., New York, N. Y., consult. engr. (**Correction**—bid date). CD 4/11.

▲ **N. Y., Tarrytown**—INN—BA 5/24—Hilton Hotels Corp., 401 7th Ave., New York, Zone 1 (selected list bidders), 1,200 room inn on 10 acre tract at Broadway and New York State Thruway Exit No. 9. $2,000,000. William B. Tabler, 401 Seventh Ave., New York, Zone 1, archt. CD 3/4.

▲ **N. J., Moorestown**—HIGH SCHOOL—BA 5/26—Bd. Educ. Moorestown Twp., constr. Senior High School. $2,000,000. Plans deposit $25. Micklewright & Mountford, Stuyvesant Ave. and Prospect St., Trenton, archts.-engrs. CD 10/9.

▲† **Md., Bethesda**—HOSPITAL ADDNS.—BA 6/10—Area Public Works Office, Chesapeake, U. S. Naval Weapons Plant, Wash. 25, D. C., two multi-story stone faced hospital addns., National Naval Medical Center, NBy-25008. Over $1,000,000. CD 2/25/59.

BUILDINGS—SLC

▲ **N. Y., Brooklyn**—SCHOOL, etc.—Diocese of Brooklyn, 75 Greene Ave., soon lets contract 3 story, bsmnt., 75,-068 sq. ft., brick, steel Bishop Raymond A. Kearney High School and 15,809 sq. ft. convent. $2,447,728. Delaney & Nelson, 101 Park Ave., New York, archts. V. L. Falotico & Assoc., 26 Court St., engrs. CD 12/1.

HEAVY CONSTRUCTION—LB & CA

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton,

Conduit & Foundation Corp., 158 North 20 St., Phila., Pa., CA **$2,118,501,** grading, paving 1.387 mi. Rte. 80, Sect. 2H, from Landing Rd. interchange to Howard Blvd. in Mount Arlington Borough and Roxbury Twp., Morris Co. Bids Mar. 29, awarded Apr. 27. CD 3/31, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg,

Pa.—**F. A. Canuso & Sons, Inc.,** 173 W. Roosevelt Blvd., Phila. 20, Pa., LB **$2,347,884** (8 bidders), 28,268 ft. divided hy. c. conc. 3 bridges T.R. 3, W. Chester Boro, W. Goshen, E. Goshen and Westtown Twps., Chester Co.;

Pa.—**Daniels Electric Equipment Co.,** 140 8 St., Pittsburgh 22, Pa., LB **$305,291** (9 bidders) roadway and bridge lighting Penn-Lincoln Parkway, Pittsburgh, Allegheny Co.;

Pa.—**Dinardo, Inc.,** 331 Bouquet St., Pittsburgh 13, Pa., LB **$223,233** (5 bidders), c. conc. base with bit. surf. 3,427 ft. T.R. 80, Pittsburgh, Allegheny Co. CD 3/31.

▲ **Leonard Shaffer Co.,** 207 S25 St., Phila. Pa., CA **$2,000,000.** AQUARIUM, 34 St., PHILA., PA. Philadelphia Aquarium, Inc., 123 S. Broad St., Phila., Pa. CD 7/10/57, under LB.

BUILDINGS—LB & CA

▲ **White Constr. Co.,** 95 Madison Ave., New York 16, N. Y., CA Est. **$1,500,000,** St. Raphael SCHOOL, CONVENT and RECTORY, EAST MEADOW, N. Y. Diocesan Bldg. Comn., 253 Sunrise Hy., Rockville Centre, N. Y. Henry V. Murphy, 1 Hanson Pl., Brooklyn 17, N. Y., archt. Bids Apr. 21.

▲ **Irons & Reynolds, Inc.,** 420 Lexington Ave., New York 17, N. Y., CA **$1,524,649,** general contract HOSPITAL and DISPENSARY BLDG. at site, FLUSHING, N. Y. Flushing Hospital, 41-14 Parsons Blvd., Flushing, N. Y. Degenhardt, Miller & Lindberg, 31 Union Sq., New York 3, N. Y., archts. CD 10/3/58.

▲ **S. S. Silberblatt, Inc.,** 25 W. 45th St., New York 19, N. Y. LB **$6,117,000,** (domestic steel) LB **$6,114,700** (foreign steel) (8 bidders) fdns. and general contract Proj. NY-5-40 West New Brighton HOUSES, Henderson Ave., Broadway, Castleton Ave. and Alaska St., Richmond Boro, WEST NEW BRIGHTON, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y., Bids Apr. 28, CD 3/29;

Argo Eng. Corp., 475 Adelphi St., Brooklyn 17, N. Y., LB **$677,998,** (3 bidders), heating and ventilating for West New Brighton Houses (West New Brighton, N. Y.);

Herman H. Schwartz, Inc., 97-11 Sutphin Blvd., Jamaica 35, N. Y., LB **$552,430,** (5 bidders), electrical work for West New Brighton Houses (West New Brighton, N. Y.;

Novak & Co., Inc., 1503 East New York Ave., Brooklyn 12, N. Y., LB **$769,937,** (6 bidders) plumbing for West New Brighton Houses, (West New Brighton, N. Y.).

▲ **John W. Ryan Contg. Co.,** 341 E. 79 St., New York, N. Y., CA **$1,750,000,** 96 two-family units JUNIOR FACULTY HOUSE, PRINCETON, N. J. Princeton University, Princeton, N. J. Bids Apr. 20. CD 3/30.

▲ **Chas. Elin & Martin Sobel, operating as Exel Homes,** 659 Eagle Rock Ave., West Orange, N. J., Owner Builds, **$2,600,000,** 104 HOUSES, Merklin Ave., WEST ORANGE, N. J. Harry A. Maslow & Irwin Miller, 48 Westfield Ave., Elizabeth, N. J., archts.

R. S. Noonan, Inc., 26 N. Duke St., York, Pa., LB **$1,815,840,** Osteopathic HOSPITAL, YORK, PA. West Side Osteopathic Hospital, Bd. Directors, 1253 W. Market St., York, Pa. Buchart Assoc., 611 W. Market St., York, Pa., and Bertram Weber, 221 N. La Salle St., Chicago, Ill., archts. CD 4/17/58.

▲ **Banks & Lee, Inc.,** Tower Bldg., Wash., D. C., CA Est. **$1,400,000,** 140 unit APARTMENT, Rock Creek Forest, Section 2, Grubb Road near East-West Hy., SILVER SPRING, MD. Eig & McKeever, 8641 Colesville Rd., Silver Spring, Md. Collins, Krondstadt & Assocs., 7705 Georgia Ave. N.W., Wash., D. C., archts.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000; other public works $88,000; Industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to **J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.**

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily
For additional reports see Construction Daily.

SOUTH

BUILDINGS—BA

▲† **Tenn., Oak Ridge**—LABORATORY—BA About 6/7—U. S. Atomic Energy Comn., Oak Ridge, 10-MEV Tandem Van De Graaff Building 5500, Oak Ridge National Laboratory area, Inv. No. 401-60-17A. Plans deposit $30. CD 12/1.

▲ **Tenn., Nashville**—AUDITORIUM—BA 5/24—City, City Hall, 10,400-seat circular auditorium, $5,000,-000. Marr & Holman, Stahlman Bldg., archts. CD 10/7/58.

▲ **N. C., Charlotte**—EDUCATION ADDN.—BA 5/25—Myers Park Baptist Church, 1900 Queens Rd., 90,000 sq. ft. education bldg. addn. $1,500,000. A. Hensel Fink, 1701 Arch St., Phila., Pa., archt.

HEAVY CONSTRUCTION—LB & CA

▲ **FLORIDA**—State Rd. Dpt., Tallahassee, Bids opened Apr. 28.

Fla.—**L. A. Reynolds Co.,** 1100 W. 1 St., Winston-Salem, N. C., LB **$1,772,732,** (7 bidders), grading, stabilizing limerock base, surf. tr., etc., 12,588 mi. SR 400, I-4-2(25)136, Job 79110-3406; SR 600, F-010-1(12) Job 79060-3501, Volusia Co.;

Fla.—**Ballenger Paving Co. Inc.,** Paris Station, Greenville, S. C., LB **$1,542,063,** (7 bidders), c. conc., limerock base with binder course, surf. tr., b. conc. surf. course, storm sewers, SR 5 (US 1), F-003-6 (13) Job 79010-3278, Volusia Co. CD 4/8 and 4/14.

▲† **Hicks & Vogel Constr. Co.,** 4236 Atlantic Blvd., Jacksonville, Fla., LB **$665,389** (1), LB **$2,699,722** (2), petty officers' mess (Open) Part I; commissioned officers' mass (Open) Part II; indoor recreational facilities Part III, U. S. Naval Station, NBy 16569, MAYPORT, FLA. Dist. P. Wks. Officer, Naval Base, Charleston, S. C. Bids Apr. 27. CD 3/23.

▲† **Winston Bros. Co.,** 301 Clifton Ave., Minneapolis, Minn., **Green Constr. Co.,** 321 Locust St., Des Moines, Iowa, and **Tecon Corp.,** Davis Bldg., Dallas, Tex., CA **$8,918,861,** Columbia Lock and Dam, Chattahoochee River, incl. control station, CIVENG-01-076-60-33, ALABAMA and GEORGIA. U. S. Eng., P.O. Box 1169, Mobile, Ala. Bids Apr. 21. CD 4/25, under LB.

▲ **MISSISSIPPI**—State Hy. Dpt., Jackson,

Miss.—**Boyd Constr. Co.,** Grenada, Miss., CA **$112,224,** 1.211 mi. grade, drain, culverts, base incl. soil cement and double bit. surf. treat and asphalt pave. US Hy. 82 between Greenwood and Winona, Proj. F-011-2 (10), Carroll Co.;

Miss.—**McDowell & McDowell,** 718 Murfreesboro Rd., Nashville, Tenn., CA **$2,459,481,** 12.52 mi. grade, drain, bit. surf. and pave. base and rein.-con. paving Interstate Hy. 55 between Miss. Hy. 558 and US Hy. 98 near McComb and Summit. Projs. I-55-1 (9) 7 & I-55-1 (10) 15, Pike Co.;

Miss.—**J. T. Reed, Contractor,** Louisville, Miss., CA **$134,755,** 5.965 mi. grade, drain, culverts and temporary gravel surf. course Miss. Hy. 22 between Edwards and Flora. Proj. S-0488 (1) A Madison Co.;

Miss.—**John H. Moon & Sons,** Ridgeland, Miss., CA **$1,237,929,** 2.931 mi. grade, drain, culverts, box bridge, bridge incid. base, concrete pave. Int. Hy. 55

(Continud on pag 94)

This is
the only
light
a bridge
needs
NEW LUPTON RAILIGHT*

New LUPTON bridge railing has built-in General Electric luminaires

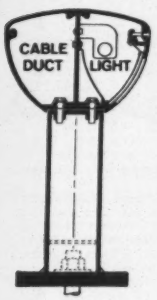
New LUPTON RAILIGHT* is today's most advanced concept in roadway lighting. Now available in standard units for all roadway installations, it offers you these significant advantages: greater driving safety from uniform low-level light focused directly on the road; unlimited opportunity for road railing design; savings in initial cost, operation, and maintenance.

Supplementary advantages are the elimination of glare; the confining of light to the road only; a clear view of roadway limits; increased effectiveness in fog, rain, or snow; efficient use of candle power.

And like every other LUPTON bridge job, installation is simple, because two men, with wrenches as their main tools, can install the lightweight aluminum parts. Maintenance is just as simple, because this non-rusting aluminum never needs painting—almost never needs replacement. And the lights themselves are handy for maintenance.

Write today to Michael Flynn Manufacturing Company's main office for more information on LUPTON RAILIGHT. Find out in detail how advantageously it can work for you.

*Trademark



This cross section of LUPTON RAILIGHT shows the cable raceway, and how easily the top can be removed for maintenance with use of a simple special tool. A rigid shield of plastic protects the luminaire. Other top rail features include a reinforcing spine, and drain holes for condensed moisture.

LUPTON® RAILIGHT*

MICHAEL FLYNN MANUFACTURING COMPANY

ALUMINUM DIVISION

Main Office and Plant:
700 EAST GODFREY AVENUE, PHILADELPHIA 24, PA. ..... FIdelity 2-5500
Sales Offices:
51 EAST 42nd STREET, NEW YORK 17, N.Y. ..... YUkon 6-6020
937 RADCLIFFE ROAD, TOWSON, MD. ..... VAlley 3-2090
4232 HERSCHEL STREET, DALLAS 19, TEXAS ..... LAkeside 6-8757
West Coast Plant & Office:
CITY OF INDUSTRY, CALIF. (LOS ANGELES CO.) ..... CUmberland 3-6407

COMMENT
from the
BUTLER ENGINEER

. . . of unbelievable accuracy in tunneling . . . and a Star at the Ready Mixed Show

A really great engineering feat! Blue River Constructors have just completed the boring operation for the Roberts Tunnel under the Continental Divide. But man, that hole is 23.27 miles long. Bored from both sides—and when the two crews met in joining they were only 1¼" off sideways and only 2" from top to bottom! 23.27 miles is 1,474,388.04 inches. Percentage wise the margin of error is 1.25 ÷ 1,474,388.04. Aw, you figure it. My slip-stick can't squat that low.

And we're no end happy to report that the equipment to line the tunnel with concrete will be by Butler.

•

Highly automated equipment shown at the Ready Mixed show. All of it good, too.

But Butler Bin popped up with a great new advance in a control system. Designated as the SP, it requires only setting two dials and touching one push button for a complete batching operation.

Mix selections are obtained by what we call a Mix Capsule. Any number can be used. Set another dial called the Batch Splitter to get the amount of any mix you want in increments of ¼ cu. yds.

The SP is so completely automated, so thoroughly interlocked and so darned simple it's absolutely fool pr——(no, I don't like that word.) Let's call it absolutely human-proof.

Not by our vote — but by the concensus of hundreds of Ready Mix owners attending the Show, Butler is again a great big step ahead of all the rest.

Write for the SP Bulletin.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

(Continued from page 91)

between Tougaloo and Ridgeland. Projs. I-IG-091-2 (20) (old) L-16 55-2 (21) 102 (new) Contr. I & I-55-2 (24) 103, Contr. I, Hinds and Madison Counties; CA **$587,672**, 0.078 mi. at bridge on Int. Hy. 55 between Tougaloo and Ridgeland, Proj. I-16-091-2 (20) (old) I-16-55-2 (21) 102 (new) Contr. II & I-55-2 (24) 103. Contr. II, Hinds and Madison Counties. Bids Apr. 26, awarded Apr. 27. Grant total $4,542,061. CD 4/15.

MIDDLE WEST

▲ **Ill., Northlake**—WAREHOUSE—BA 5/17—The Kroger Co., 1041 Vine St., Cincinnati, O., 475,000 sq. ft. chain store warehouse and distribution center, Provison Industrial Park, $4,000,000. Hixson, Tarter & Assocs., 2306 Park Ave., Cincinnati, O., archts. CD 4/28.

▲ **O., University Heights**—LIBRARY—BA About 5/25—John Carroll University, library, $1,500,000. Charles Bacon Rowley & Assoc., Inc., Ernest Payer, Keith Bldg., Cleveland, Zone 15, archts. CD 2/9.

BUILDINGS—SLC

▲ **Ill., Arlington Heights**—SCHOOL—Catholic Archdiocese of Chicago, 719 N. Wabash Ave., and Clerics of St. Viator, Euclid Ave., soon lets contract 2 and 3 story, limestone St. Viator High School, gymnasium and swimming pool, Euclid and Oakton Sts. $2,500,000. Stickle & Assocs., 2422 Prospect Ave., Cleveland 15, O., archts. CD 3/3.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15, Bids opened 4/26,

O.—**The Penker Constr. Co. & De Salvo Constr. Co., Inc.**, 1030 Summer St., Cincinnati, O., LB **$4,189,066**, est. $5,017,100, (9 bidders), Type T-71 and structures 2.014 mi. SR 4-18.43, U-681 (18) US-1262 (1), City of Dayton, Montgomery Co.;

O.—**The Penker Constr. Co.**, 1030 Summer St., Cincinnati, O., LB **$873,645**, est. $970,700, (17 bidders), Type T-35, on B-20 and structure 0.213 mi. SR-7-13.36, UG-430 (13), Village of Mingo Junction, Jefferson Co.;

O.—**V. N. Holderman & Sons Co.**, 890 Oakland Park Ave., Columbus, O., LB **$542,368**, est. $582,600, (4 bidders), Type T-71 and structure, 2.818 mi. USR-50-1.26 Ross Co. CD 4/5.

▲ **MICHIGAN**—State Hy. Dpt., Escanaba,

Mich.—**S. J. Groves & Son**, 3700 Carpenter Rd., Ann Arbor, Mich., CA **$1,650,193**, reconstr. 9.5 mi. US 141 from Baraga-Iron County line north to M-28, Baraga Co.;

Mich.—**Proksch Constr. Co.**, 132 Third Ave., Iron River, Mich., CA **$817,895**, 12.2 mi. grading, drainage structures on M-35, Houghton Co. Bids Apr. 13, awarded Apr. 19. CD 4/18, under LB.

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing, Bids opened 4/27,

Mich.—**Hallaway Constr. Co.**, 29350 Jay Rd., Livonia, Mich., LB **$3,676,378**, 7.8 mi. US 12 freeway (Int. 94) incl. five structures from Snow Rd. South of Bridgman north to Ridge Rd. just north of Stevensville, Berrien Co., CD 4/20,

Mich.—**Sargent Constr. Co.**, 2840 Bay Rd., Saginaw, Mich., LB **$2,004,093**, 2.9 mi. freeway and three structures from 28th St. northwesterly to Cascade Rd. US 16BR, Kent Co., CD 4/20, LB **$2,642,746**, 5 mi. US 23 freeway and four structures from Birch Run Rd. (northern terminus of Fenton-Clio Freeway) north to Townline Rd., Saginaw Co., CD 4/29;

Mich.—**L. W. Edison Co.**, 3134 Midland Dr. S.E., Grand Rapids, Mich., LB **$3,181,435**, 2.5 mi. freeway from Cascade Rd. northwesterly to Leffingwell Ave. incl. four structures, Kent Co.,

Mich.—**Carl Goodwin & Sons**, 500 Delano St., Allegan, Mich., LB **$3,346,884**, 6.2 mi. US 16 freeway Int. 196 and 10 structures which will extend completed Coopersville-Marne freeway in Ottawa county easterly to Bristol Rd. in Kent Co., Kent and Ottawa Counties. CD 4/14;

Mich.—**L. A. Davidson**, 213 E. St. Joseph, Lansing 33, Mich., LB **$3,075,525**, 4.1 mi. freeway and four structures from Townline Rd. north to Bridgeport, CD 4/20;

Mich.—**C. F. Replogle**, Circleville, O., LB **$2,265,177**, 7 mi. of freeway and two structures from Perry to Bancroft, Shiawassee Co., CD 4/20;

Mich.—**Denton Constr. Co.**, 20415 Mack Ave., Grosse Pointe Woods 36, Mich., LB **$2,541,706**, 5.2 mi. freeway and three structures from Bancroft to Durand where it will connect with section now under constr. between Durand and Flint, Shiawassee Co., CD 4/20;

Mich.—**Pierson Contg. Co.**, 200 Eddy Bldg., Saginaw, Mich., LB **$2,186,750**, 5.1 mi. US 12 freeway Int. 94 and four structures from Ann Arbor westerly to Baker Rd. Washtenaw Co., CD 4/13;

BUILDINGS—LB & CA

▲ **Arnold Lies Co.**, 1515 New York St., Aurora, Ill., Owner Builds, **$2,000,000**, 20-unit SHOPPING CENTER, West Aurora Plaza, U.S. 30 and Edgelman Ave., AURORA, ILL.

▲ **C. A. Tharnstrom & Co.**, 7401 St. Louis Ave., Skokie, Ill., CA **$2,500,000**, 13 story Tower Court APARTMENTS, swimming pool, GARAGE, Michigan and Chicago Aves., CHICAGO, ILL. Sam E. Schulman 61 E. 8 St., Chicago 5, Ill. Bids Apr. 12. Awarded Apr. 29. CD 4/11.

▲ **K. H. Kettelhut**, Box 998, Lafayette, Ind., CA **$3,668,530**, three 95,000 sq. ft. JUNIOR HIGH SCHOOLS, North Side, South Side and East Side, DANVILLE, ILL. Bd. Educ., School Dist. 118, 202 E. Fairchild St., Danville, Ill. Bids Mar. 17. CD 4/13, under LB.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲† **N. M., Roswell**—OPERATIONAL BASE MISSILE LAUNCH COMPLEXES—BA About 6/15—U. S. Eng., P.O. Box 1538, Albuquerque, 12 WS-107A-1 operational base missile launch complexes, each consisting of rein-con. silo, launch control center bldg., access roads, utilities, Walker Air Force Base, ENG-29-005-60-92. Over $10,000,000. Plans deposit $10. CD 1/29.

BUILDINGS—BA

▲† **Mo., Knob Noster**—HOUSING—BA 5/17—Base Procurement Office, Whiteman Air Force Base, Knob Noster, Mo., armed services housing to include 296 bldgs. with 504 units, Whiteman Air Force Base. $9,000,000. Extended date. Plans deposit $150. Williamson, Loebsack & Assocs., P.O. Box 1219, Topeka, Kan., archts. CD 4/19.

▲ **Ark., Fayetteville** — DORMITORY — BA 5/18 — University of Arkansas, Fayetteville, 10 story freshmen male student dormitory. $1,672,000. Plans deposit $50. Mott, Mobley & Horstman, Merchants National Bank Bldg., Fort Smith, archts. Pettit & Pettit, Wallace Bldg., Little Rock, engrs. CD 7/17.

▲ **Mo., Moberly**—MEDIMUM SECURITY PRISON—BA 5/31—Missouri Bd. P. Bldgs., 100 State Capitol, Jefferson City, Medium Security Prison, incl. twin 2 story dormitories, chapel, auditorium and recreation center, vocational and industrial shops, power house, etc. $8,500,000. Extended date. Marcel Boulicault, 411 N. 7th St., St. Louis, Zone 1, archt. Curbin & Davis, 2475 Canal St., New Orleans, La., assoc. archts. CD 4/18.

▲† **Tex., El Paso**—RADAR PARK-HAWK—BA About 6/8—U. S. Eng., P.O. Box 1538, Albuquerque, N. M., Radar Park-Hawk (Tobin Wells), Fort Bliss, ENG-29-005-60-85. $1,500,000. CD 9/25.

HEAVY CONSTRUCTION—LB & CA

▲† **J. E. Latta Constr. Co., Inc.**, 6609 Latta Pl., St. Louis 33, Mo., LB **$1,948,499**, est. $2,039,740 (10 bidders), levee, floodwall, closure structures, sewer alterations and pumping stations, Proj. Items L-1, F-1, S-1, S-2, P-1 and P-2, St. Louis, CIVENG 23-065-60-41, MISSOURI. U. S. Eng., 420 Locust St., St. Louis 2, Mo. Sverdrup & Parcel, Inc., 915 Olive St., St. Louis 1, Mo., engr. Bids Apr. 28. CD 3/25.

▲† **Lindberg Constr. Co.**, Jamestown, N. D., LB **$1,329,905**, 10 (bidders), foundations and furnishing, erecting steel towers for 84 mi. Jamestown-Fargo 230-kv transmission line No. 2, Missouri River Basin Proj. Spec. DC-5290, NORTH DAKOTA. Bureau Reclamation, Dpt. Interior, Fargo, N. D. Bids Apr. 26. CD 3/11.

▲† **Western Contg. Co.**, 400 Benson Bldg., Sioux Falls, Iowa, CA **$3,043,278**, first stage, earthwork Big Bend Dam, Fort Thompson, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids Mar. 31. (Correction—contractors address.) CD 4/12, under CA.

BUILDINGS—LB & CA

▲ **Madson Constr. Co.**, 2823 Lyndale Ave. S., Minneapolis, Minn., CA **$1,597,400** general contract HIGH SCHOOL, HUTCHINSON, MINN. Bd. Educ. Independent School Dist. No. 423, Hutchinson, Minn. Bids Apr. 20. CD 4/26, under LB.
A. Newman Heating & Plumbing, 1608 Como Ave., St. Paul, Minn., CA **$534,450**, mechanical work for high school (Hutchinson, Minn.).

▲ **Huber, Hunt & Nichols**, Box 128, Indianapolis, Ind., CA Total cost **$2,000,000** (8 bidders), Western Electric Plant, site clearing, grading, constr. substructure for Bldgs. Nos. 20, 30, 40, 41 & 51, incl. roads, 4,202 car parking, railroad facilities, LEE'S SUMMIT, MO. Western Electric, 195 Broadway, New York, N. Y. Bids Apr. 26, awarded Apr. 27. CD 4/19.

▲ **Home Investment Co.**, 1305 Oak Grove Rd., Fort Worth, Tex., Owner Builds, **$2,000,000**, two hundred 1 story, brick veneer RESIDENCES, 1200 to 1500 sq. ft. fl. space in Highland Hills Area, 2nd Sect., FORT WORTH, TEX. Carter & Burgess, 1100 Macon St., Fort Worth, Tex., engrs.

▲ **Manhattan Constr. Co.**, 1811 Crawford St., San Antonio, Tex., LB **$9,298,000**, CITY-COUNTY HOSPITAL, HOUSTON, TEX. City of Houston, City Hall, and Harris County, Courthouse, Houston, Tex. CD 3/31.

▲ **McKenzie Constr. Co.**, P. O. Box 806, San Antonio, Tex., CA **$2,286,000**, 6 story, bsmnt., 180,000 sq. ft. ADMINISTRATIVE OFFICE, St. Mary's St., Lexington Ave., McCullough Ave. at River, incl. site area earthwork and auto parking, SAN ANTONIO, TEX. Southwestern Bell Telephone Co., 3333 Fannin St., Houston, Tex. Bids Mar. 22. CD 3/8.

▲ **F. R. Orr Constr. Co.**, 4414 Vine St., Denver, Colo., LB **$1,441,606**, 3 story, 100,000 sq. ft. PLANT ADDN., DENVER, COLO. Marin Co., 2250 South Highway No. 75, Littleton, Colo. Bids Apr. 28. CD 4/5.

▲ **Robert E. McKee, General Contractor, Inc.**, P. O. Box 1748, Albuquerque, N. M., CA **$2,200,040**, HOSPITAL CENTER, ALBUQUERQUE, N. M. Presbyterian Hospital Center, 1012 Gold Ave. S.E., Albuquerque, N. M. CD 4/1, under LB.

FAR WEST

BUILDINGS—BA

▲ **Ore., Portland**—CLASSROOM—BA 5/26—Oregon Bd. Higher Educ., Box 5175, Eugene, Classroom Bldg.

(Continued on page 96)

UP TO STANDARD . . . from the very start

The making of quality concrete begins in the concrete plant. Here, then, is where quality standards should start.

The Concrete Plant Manufacturers Bureau (CPMB) now provides such standards for all components. You are assured that new concrete plants and components manufactured and certified by member companies will be *up to standard* from the very start.

229 Years of Combined Experience

Back of these standards are the engineering technology and all-important practical experience of the country's leading plant builders. This experience is of impressive proportions. Member companies constituting the Bureau have spent a combined total of 229 years developing the perfected design and operational efficiency reflected in the best concrete plants of today.

The standards were adopted March 1, 1960 with the prior approval of the Board of Directors of the National Ready Mixed Concrete Association.

A certifying Rating Plate is attached to all equipment manufactured in compliance with the Bureau standards and shipped by member manufacturers since that date.

Same Language, Same Yardsticks

The new standards are of obvious advantage to the construction industry. They establish a uniform nomenclature — standard, universally acceptable terms for the various types of bins, silos, batchers, elevators and conveyors which store and handle cement and aggregates. They define the precise yardsticks by which all capacities are now measured. They provide the guarantee of those capacities through Rating Plates, permanently affixed.

Printed Standards Now Available

You will want a copy of the complete "Concrete Plant Standards." Interested ready mixed concrete producers, contractors and engineers are asked to direct their requests to the Concrete Plant Manufacturers Bureau, 1411 K Street N. W., Washington 5, D. C.

CONCRETE PLANT MANUFACTURERS BUREAU (CPMB)

An affiliate of the National Ready Mixed Concrete Association

BLAW-KNOX COMPANY
Pittsburgh, Pa.

BUTLER BIN COMPANY
Waukesha, Wis.

CHAIN BELT COMPANY
Milwaukee, Wis.

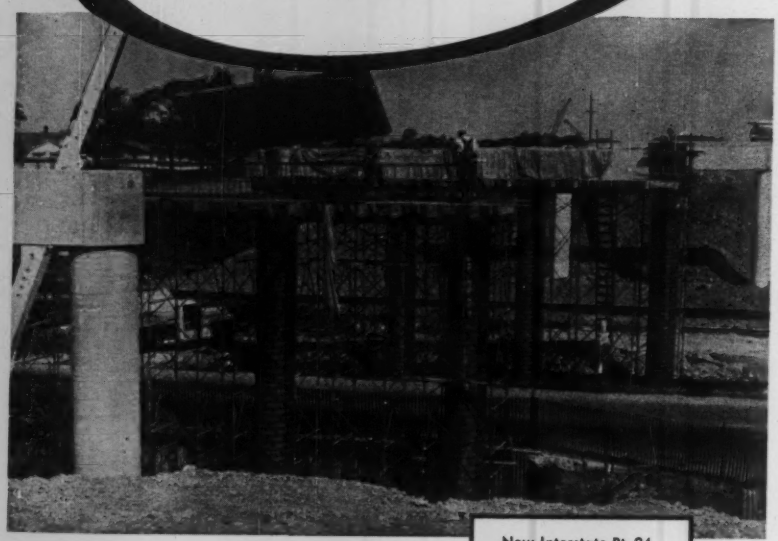
ERIE STRAYER COMPANY
Erie, Pa.

THE HELTZEL STEEL FORM AND IRON COMPANY
Warren, Ohio

THE C. S. JOHNSON COMPANY
Champaign, Ill.

NOBLE COMPANY
Oakland, Calif.

Strong, Dependable Forms for extra-high round concrete columns



New Interstate Rt. 94, South Milwaukee, Wisconsin. Contractor: Linnan Construction Company. Architect: Wisconsin Highway Dept. Engineer: Consoer, Townsend & Associates

Form round concrete columns with

SONOCO

***Sonotube*®**

FIBRE FORMS

and *save* time, labor and money.

These 27 ft. high, 3 ft. diameter overpass piers contain approximately a ton of concrete every two feet . . . all the way up! SONOTUBE Fibre Forms, used in this project, handled the tremendous weight at such heights perfectly, and permitted the 27 foot drop of the first pour without damage to the forms.

Used in bridges, overpasses, or buildings, SONOTUBE Fibre Forms are lightweight and easy to place, brace, pour, and strip . . . provide the fastest, most economical forming method for round columns of concrete.

And, left in place on the column for the curing period, SONOTUBE Fibre Forms provide a "wet cure" for concrete . . . eliminate the need for wet coverings or expensive curing treatments.

Choose from 3 types: Seamless (for finished columns); "A" Coated (for exposed columns); or "W" Coated (for unexposed columns). Order Sonoco SONOTUBE Fibre Forms in specified lengths or standard 18' shipping lengths . . . sizes from 2" to 48" I.D. Can be sawed.

See our catalog in Sweet's

For complete information and prices, write

- HARTSVILLE, S. C.
- LA PUENTE, CALIF.
- FREMONT, CALIF.
- MONTCLAIR, N. J.
- AKRON, INDIANA
- LONGVIEW, TEXAS
- ATLANTA, GA.
- BRANTFORD, ONT.
- MEXICO, D. F.

SONOCO

Construction Products

SONOCO PRODUCTS COMPANY

4272

(Continued on page 94)

South Portland State College. $2,750,000. Steward & Richardson, 219 S.W. Stark St., Portland, archts. CD 11/27.

▲ **Ore., Corvallis** — PHYSICS-CHEMISTRY — BA 6/3 — Bd. Higher Education, Box 5175, Eugene, second unit, Physics-Chemistry bldg., Oregon State College. $2,515,000. Burns, Bear, McNeil & Schneider, 5502 N.E. Glisan St., Portland, archts. CD 11/27.

▲ **Wash., Seattle**—HOSPITAL—BA 6/7—Virginia Mason Hospital Assn., 1111 Terry Ave., 4 story, 55 x 193 ft. and 50 x 111 ft., rein.-con. hospital addns. $2,000,000. Plans deposit $50 for general. Naramore, Bain, Brady & Johanson, 904 7 Ave., archts. CD 11/11.

HEAVY CONSTRUCTION—LB & CA

▲ **UTAH**—State Rd. Comn., State Capitol, Salt Lake City, Bids opened 4/26,
W. W. Clyde & Co., Springville, Utah, LB **$2,149,025,** (6 bidders), 8.684 mi. US 189, Proj. 1-80-4(5) 145, Summit Co. CD 10/10/57.

▲ **UTAH**—State Rd. Comn., State Capitol, Salt Lake City, Zone 11,
W. W. Clyde, Springville, Utah, CA **$2,149,025,** 8.684 mi. US 189, Proj. 1-80-4 (5) 145, Summit Co. Bids Apr. 26. CD 5/2, under LB.

▲† **Donald M. Drake Co.**, 1600 N.W. Savier St., Portland, Ore., CA **$1,327,700,** South Jetty repair, mouth of Columbia River, near Astoria, CIVENG-35-026-60-160, OREGON and WASHINGTON. U. S. Eng., 628 Pittock Block, S.W., 10 Ave and Washington St., Portland 5, Ore. Bids Apr. 22. CD 4/28, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,
Ball & Simpson, 685 Delaware St., Berkeley, Calif., CA **$2,122,412,** relocation 4.2 mi. US Hy. 395 to eliminate steep and winding section on Conway Grade, IX-MNO-23-H, 1, Mono Co. Bids Apr. 20. CD 4/22, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,
Griffith Co., 1060 S. Broadway, Los Angeles, Calif., CA **$2,672,562,** grading, paving 2.9 mi. four lane freeway US Hy. 80 between 0.2 mi. west of Magnolia Ave., El Cajon and 0.7 mi. east of 3rd St., incl. 5 bridges and interchange facilities, XI-S.D.-12,Ec,J.C., San Diego Co. Bids Apr. 21. CD 4/26, under LB.

▲† **Fred A. Arnold**, 3105 Hollycrest, Los Angeles, Calif., LB **$1,883,939,** est. $1,961,000, (10 bidders), constr. various bldgs. Naval Missile Facility, Point Arguello, IFB 25930/59, POINT MUGU, CALIF. Dist. P. Wks. Office, 11th Naval Dist., San Diego, Calif. Bids Apr. 27. CD 3/24.

BUILDINGS—LB & CA

▲ **Pacific Coast Builders**, No. 1 South Park, San Francisco, Calif., LB **$1,444,000,** Base Bid, (7 bidders), concrete block wall, concrete floors, prestressed concrete roof Terra Nova HIGH SCHOOL Pacifica, DALY CITY, CALIF. Jefferson Union High School Dist., 375 S. Mayfair, Daly City, Calif. Falk & Booth, 16 Beale St., San Francisco, Calif., archts. Bids Apr. 21. CD 1/8/57.

▲ **Williams & Burrows, Inc.**, 500 Harbor Blvd., Belmont, Calif., CA **$3,565,000,** Phase II, 3 story bsmnt., 140,000 sq. ft., steel frame ECONOMICS RESEARCH and OFFICE MENLO PARK, CALIF. Stanford Research Institute, 333 Ravenswood Ave., Menlo Park, Calif. Stanton & Stockwell, 627 South Carondalet, Los Angeles, Calif., archts. Clyde E. Bentley, 405 Sansome St., San Francisco, Calif., engr. CD 2/6/59.

▲† **M. R. Fisher**, 10835 Santa Monica Blvd., Los Angeles, Calif., CA **$1,329,000,** COMMUNICATION SCHOOL FACILITIES, Naval Training Center, Spec. 10017, SAN DIEGO, CALIF. Dist. P. Wks. Office, 11th Naval Dist., 1220 Pacific Hy., San Diego, Calif. Frank L. Hope & Assoc., 1447 6th Ave., San Diego 1, Calif., archts. Bids Apr. 5. CD 4/22, under LB.

▲ **James R. Roberts Co.**, 4444 Piedmont, Oakland, Calif., LB **$1,924,200,** (6 bidders), 4 story, 100-bed 62,000 sq. ft., rein.-con. San Leandro Memorial HOSPITAL, MacArthur Blvd. and Benedict Dr., SAN LEANDRO, CALIF. East Bay Lutheran Hospital Assn., 1332 E. 14th St., San Leandro, Calif. Bids Apr. 22. CD 4/19.

CANADA

HEAVY CONSTRUCTION—BA

▲ **Ont., Toronto** — BA 5/17 — Municipality of Metropolitan Toronto, 67 Adelaide St. E., grade separation, interchange, Kipling Ave., Dundas and Bloor Sts. W., incl. draining, grading, structural plate pipe under CPR tracks by tunneling method, b. conc. paving on concrete base, retaining wall, $1,300,000. Plans deposit $50. Extended date. CD 4/22.

BUILDINGS—BA

▲ **Que., Montreal**—HOUSING—BA 5/17—City, City Hall, Montreal, Phase III, Jeanne Mance low-rental housing, incl. forty-four 2 story row houses, 78 apartment units, thirteen 3 story walk-up buildings, St. Dominique, Ontario, Sanguinet Sts. and rear of St. Catherine St., $1,500,000. Plans deposit $50. Greenspoon, Freedlander & Dunne and Jacques M. Morin, 2165 Clifton Ave., archts. D'Allemagne & Barbacki, 3180 Van Horne Ave., engrs. CD 12/2/58.

HEAVY CONSTRUCTION—LB & CA

▲ **Canadian Westinghouse Co. Ltd.**, 286 Sanford St. N., Hamilton, Ont., CA **$2,500,000,** three 8,500 hp. gas turbines for compressor drivers, natural gas export line to U. S., ONTARIO. Trans-Canada Pipe Lines, Ltd., 150 Eglinton Ave. E., Toronto, Ont. CD 4/8.

▲ **QUEBEC**—Province of Que., Dpt. P. Wks., Parliament Bldgs., Quebec City,
Que.—Quemont Construction Ltd., 6655 Cote de Neiges

Rd., Montreal, Que., CA Est. $7,500,000. Bridge No. 1, 3,100 ft. 6-lane, from Ste. Anne de Bellevue to Ile aux Vaches, part of western approach to Island of Montreal.;

Que.—**Norema Construction Ltd.**, 184 Maplewood Ave., Outremont, Que., CA Est. $1,500,000; Bridge No. 2, 650 ft. 6-lane from Ile aux Vaches to Isle Perrot;

Que.—**Cremazie Construction Ltee.**, 190 Cremazie Blvd. E., Montreal, Que., CA Est. $5,500,000. Bridge No. 3, 2,300 ft. long 6-lane from Ile Perrot to Point Schmidt. Grand total $14,500,000. CD 12/17.

BUILDINGS—LB & CA

▲ **Bird Constr. Co. Ltd.**, Sargent and Erin Sts., Winnipeg, Man., CA Est. $3,000,000, 5 story OFFICE, Broadway Ave., WINNIPEG, MAN. Monarch Life Assurance Co., Toronto-Dominion Bank Bldg., Winnipeg, Man. Bids Apr. 5. CD 3/4.

▲ **Angus-Robertson Ltd.**, 57 Bloor St. W., Toronto, Ont., CA Est. $2,000,000, FACTORY and OFFICE addn., TORONTO, ONT. English Electric Co. of Canada Ltd., (John Inglis Co. Ltd.), 14 Strachan Ave., Toronto, Ont. Bids Apr. 5, awarded Apr. 22. CD 4/6.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Costa Rica, San Jose**—BA 6/15—Gobernador de la Provinca, Ejecutive, Municipal, San Jose, water sys. $3,000,000. Plans deposit $4.52. Rader & Assoc., 111 N.E. 2nd Ave., Miami, Fla., U.S.A., engrs.

FOREIGN

BUILDINGS—BA

▲ **Bahamas, Nassau**—APARTMENT—BA 5/25—Blue Bay Developments, Inc., Butler-Sands Bldg., Bay and East Sts., Blue Vista Apartments, 6 story, part bsmnt. penthouse, 159x161 ft., 2 story 57x96 CB-S, 2 story, 25x62 ft. pool, sewerage and water plants, paving, electric, etc. West Bay St. $1,500,000. Kononoff, Smith & Hamer, 620 NW 32 St., Miami, Fla., U.S.A., archts. Kononoff & Smith, Inc., 620 NW 32nd St., Miami, Fla., U.S.A., consult. engr.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ **AFGHANISTAN** — International Cooperation Administration, 815 Connecticut Ave. N.W., Wash. 25, D. C., U.S.A. for Royal Govt. of Afghanistan, Kabul. Bids opened 4/29,

A. L. **Dougherty Overseas, Inc.**, 420 Lexington Ave., New York, N. Y., U.S.A., LB Over $3,000,000, 70 mi. shaping and paving Kandahar-Spin Baldak Hy. CD 3/18.

BUILDINGS—LB & CA

▲ **Bechtel Corp.**, 220 Bush St., San Francisco, Calif., U.S.A., CA Est. $11,000,000, steel, concrete Southern Cross HOTEL, MELBOURNE, AUSTRALIA. Intercontinental Hotel Corp. (Pan American Airways), 135 E. 42nd St., New York, N. Y., U.S.A., and Southern Cross Proprietary Ltd., Melbourne, Australia. Welton Becket & Assocs., 5657 Wilshire, Los Angeles, Calif., U.S.A., and Leslie Perrott & Partners, Melbourne, Australia, archts. CD 12/29.

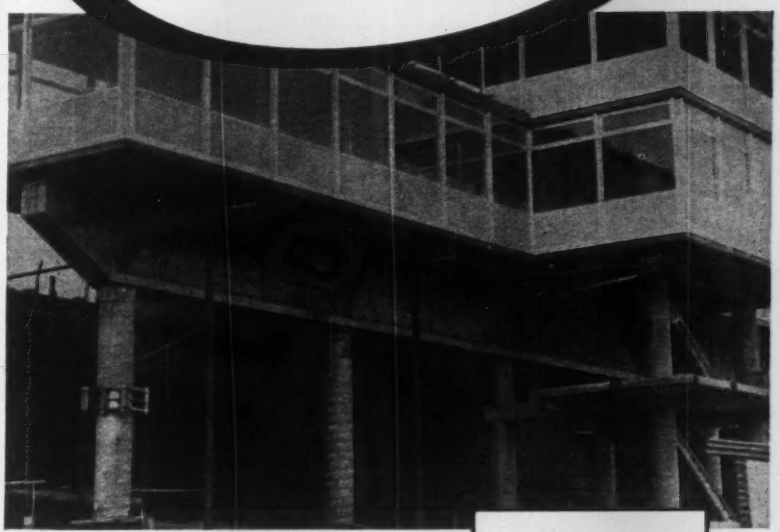
PROPOSED PROJECTS

WATER SUPPLY

▲ **O., Cincinnati**—City, City Hall,
intake tunnel and water supply pumping station, $4,625,000.
completion of intake tunnel and pump station, $1,125,000.
water mains, Anthony Wayne Ave., Millsdale to Burns St., $460,000.
treated water pumping facilities, Cherry Grove Station, $500,000; treated water storage tanks, Cherry Crove, $500,000.
water mains, Colerain Park, Calbraith Rd. to Springdale Rd., $376,000.
water mains Cooper Rd., Kenwood to Montgomery Rd., $229,000.
partial constr. covering Eden Park Reservoir, $600,000; dual water lines, mains, station at Eden Park, $500,000; partial constr. covering Eden Park Reservoir, $2,000,000; dual water lines, water mains, station at Eden Park, $500,000; completion of covering Eden Park Reservoir, $2,000,000.
water mains, Front St., Freeman Ave. to 6th St., $160,000.
covering water tank, Kennedy Heights, $100,000; Kennedy Heights water pumping station, $80,000.
water mains, Mill Rd., Mt. Healthy to Waycross, $525,000.
completing water mains, Millsdale, Burns, Glendale-Milford Rd., $440,000; water mains, Millsdale-Burns-Glendale, Milford Rd., first section, $440,000.
partial constr. covering Mt. Airy water tank, $175,000; completing covers for Mt. Airy water tank, $175,000.
reconstr. Mt. Washington water tank, $200,000.
water treatment storage tank, Northern area, $1,000,000.
water mains Princeton Pike, Glendale-Milford Rd. to Kemper Rd., $400,000.
partial constr. 30 in. water mains, Reading Rd. from Glendale-Milford Rd. to Kemper Rd., $200,000. CD 1/6/59; partial constr. water mains Reading Rd., Glendale-Milford Rd. to Kemper Rd. $300,000. CD 1/6/59.
water mains, Springdale Rd., Colerain Rd. to Mill Rd., $525,000.

on ANY job...

Most Economical Forms for Round Concrete Columns



Indianapolis Speedway Tower. Designer: Fink, Roberts and Petrie. Contractor: H. D. Tousley Company

Use versatile, easy-to-handle

SONOCO Sonotube® FIBRE FORMS

With FIVE different types of SONOTUBE Fibre Forms, each having special characteristics, Sonoco can provide the *job-suited* form which best meets requirements of column size, surface, location *and cost.*

And, SONOTUBE Fibre Forms are versatile; they can be sawed, fitted to beam forms, and punched for tie-in rods or anchor bolts. Use them to form full round, half round, quarter round, or obround columns and pilasters.

SONOTUBE Fibre Forms are easy to place, brace, pour, and strip . . . provide the fastest, most economical forming method for round columns of concrete.

Choose the type that meets your requirements most economically:

1. Seamless—premium form for finished columns.
2. "A" Coated—standard form for exposed columns.
3. "W" Coated—For unfinished or unexposed columns.
4. Encasement Form—for concrete encasement of existing posts, piles, etc.
5. Special—for use in water or excessive dampness.

Order specified lengths or standard 18' shipping lengths . . . sizes 2" to 48" I.D.

See our catalog in Sweet's

For complete information and prices, write

- HARTSVILLE, S. C.
- LA PUENTE, CALIF.
- FREMONT, CALIF.
- MONTCLAIR, N. J.
- AKRON, INDIANA
- LONGVIEW, TEXAS
- ATLANTA, GA.
- BRANTFORD, ONT.
- MEXICO, D.F.

SONOCO Construction Products

4273

SONOCO PRODUCTS COMPANY

PLUMBING, HEATING AND PIPING ESTIMATORS' GUIDE

Just Published—Shows how to make complete, accurate estimates in all areas of plumbing, heating, and piping work. Gives 75 "labor factor" tables pinpointing various elements of work involved. Explains specific cost analysis methods which enable you to check your final bid against the original estimate. **By Paul G. Davis, Supervisor of Construction, Gamble, Pownall, and Gilroy. 208 pp., 94 tables and illus., $6.50.**

ESTIMATING STRUCTURAL STEEL

Including Structural Aluminum and Miscellaneous Materials

Brings you tested methods for compiling profitable bids on bridges, buildings, and other types of construction. Describes the equipment, tools, materials, and labor involved in all phases of fabrication and erection. Included are details on how to estimate columns, beams, connections, built-up sections, girders, etc. **By G. A. Saunders, Lehigh Structural Steel Co. 274 pp., 176 illus., $9.50**

PRACTICAL PRESTRESSED CONCRETE

Just Published! Gives basic principles, procedures, and numerical examples for the design of safe, economical, prestressed concrete structures. Covers materials, pre-tensioned and post-tensioned methods, specifications, bridge and roof design, piles, typical members, continuous structures, and other practical topics. **By H. K. Preston, John A. Roebling's Sons Corp. 360 pp., 136 illus., $11.50**

BUILDING CONSTRUCTION ESTIMATING

Shows you step-by-step the everyday work and specialized techniques of the building construction estimator. Covers contracting as a business, building codes, plans, and techniques of estimating. Also treats the estimating of work done by both the general contractor and the sub-contractors. This edition includes new and expanded material on contracts, hardware, plumbing, air conditioning, etc.; sample estimating sheets have been revised and new plans added. **By G. H. Cooper, Bldg. Contractor; Mechanics Inst. Second Edition, 398 pp., 180 illus., $7.50**

10 DAYS' FREE EXAMINATION

McGraw-Hill Book Co., Dept. NR-5-12
327 W. 41st St., N.Y.C. 36

Send me book(s) checked below for 10 days' examination on approval. In 10 days I will remit for book(s) I keep, plus few cents for delivery costs, and return unwanted book(s) postpaid. (We pay delivery costs if you remit with this coupon—same return privilege.)

☐ Davis—**Plumbing, Heating, Piping Est. Guide, $6.50**
☐ Saunders—**Estimating Struc. Steel, $9.50**
☐ Preston—**Pract. Prestressed Concrete, $11.50**
☐ Cooper—**Bldg. Constr. Estimating, $7.50**

(PRINT)
Name .....
Address .....
City .....Zone ....State .....
Company .....
Position .....

For price and terms outside U. S. write McGraw-Hill Int'l, N. Y. C. NR-5-12

water mains, Springdale-Winton to Mill Rds. $300,000.
water mains, Stanton Ave., McMillan St. to Beecker, $147,000.
water mains, State Ave., $150,000.
first section water mains, Ravine St., Warner-McMillan Expressway, $88,000.
water mains, Waycross, Pippin and Kemper Rds., $472,000.
treated water pumping facilities expanson, Western Hills Station, Queen City Ave., $130,000.
water treatment storage tank, Western section, $1,000,000.
water mains, 9th and Main Sts., to Eden Park, $650,000. Black & Veatch, Meadow Lake Pky., Kansas City, Mo., consult. engrs. on foregoing projects.
Gest St. water mains, 36 in. main, east of New Linn St. to Harriet St., $154,000; 16 in. water mains, 5th St. to Freeman Ave., $111,000; Ninth St. water mains relocating 42 in. main, Mound to Central Ave., $63,000, Part of Kenyon-Barr Program.

SEWERS, WASTE DISPOSAL

▲ **N. J., Trenton**—Hamilton Twp., Municipal Bldg., 2090 Greenwood Ave., drains along streams, $2,800,000. First stage to start in 1962. Parsons, Brinckerhoff, Quade & Douglas, 165 Broadway, New York 6, N. Y., consult. engrs. CD 10/18/56.

▲ **Ont., Windsor**—City, Council, sewage treatment facilities, incl. interceptor line, $9,000,000. C. G. R. Armstrong, Bartlett Bldg., consult. engr. CD 10/24/56.

STREETS AND ROADS

▲ **CONNECTICUT**—State Hy. Dpt., 24 Wolcott Hill Rd., Wethersfield,
Meriden and Wallingford—Interstate Rte. 91, 6.3 mi. from 0.4 mi. south of Center St. (Rte. 150), Wallingford to 200 ft. south of E. Main St. Meriden, $6,000,000. Arnold H. Vollmer Assocs., 25 W. 45th St., New York, N. Y., consult. engrs.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg,
Berks Co.—5-mile by-pass highway, northwest of Reading from north of Sinking Springs to vicinity of Tuckertown, $4,000,000. A. L. Wiesenberger Assocs., 529 Hamilton St., Allentown, consult. engrs.

AIRPORTS

▲† **Ariz., Tucson**—TITAN MISSILE—U.S. Eng., 751 S. Figueroa St., Los Angeles, Calif., Titan Missile Base, with 18 dispersed underground launching sites near Davis-Monthan Air Force Base, $80,000,000.

▲ **Calif., Lompoc**—MISSILE LAUNCH TRAINING COMPLEX—U.S. Eng., 751 Figueroa St., Los Angeles, missile launch training complex, Vandenberg Air Force Base. $8,000,000 (funds released).

▲† **Kan., Wichita—TITAN MISSILE** BASE, etc.—U.S. Eng., Federal Office Bldg., Kansas City, Mo., Titan Missile Base with eighteen dispersed underground launching sites near McConnell Air Force Base. $80,000,000.

AMERICANS ABROAD

▲ **Philippine Islands**—REFINERY—Gulf Oil Corp., Gulf Bldg., Pittsburgh 19, Pa., U.S.A., 13,500 bbl. crude refinery, Luzon area. $4,775,000.

PUBLIC BUILDINGS

▲ **Calif., Escondido**—SCHOOLS—Escondido Union Elementary School Dist., voted Apr. 20 $2,000,000 bonds and $5,000,000 request for state loan for school construction.

▲ **Hawaii, Honolulu** — SCHOOLS — City and Honolulu County, City Hall, 2nd high school, Kanehoe Area, $1,500,000; Elementary-Intermediate School, Kumilouni Valley, Kai Sub-Division, $1,500,000.

▲ **Ill., Crystal Lake**—SCHOOL—Crystal Community High School Dist., 45 W. Franklin St., bond election May 21, high school, $2,200,000.

▲ **Minn., St. Anthony**—SCHOOL—Bd. Educ., voted $1,750,000 bonds Apr. 21, Junior-Senior High School. Hammel & Green, 2650 University Ave., St. Paul, archts. CD 3/21.

▲ **N. J., Elizabeth**—HOUSING—Housing Auth. of Elizabeth, 688 Maple Ave., plans by A. A. Kaufmann, 252 N. Broad St., and McMurray Assocs., 983 Stuyvesant Ave., Union, 250 unit old age housing, Proj. NJ 34, Eliz. $5,000,000. CD 4/5.

▲ **N. J., Jersey City**—HOUSING—Housing Auth. of City of Jersey City, 514 Newark Ave., plans by Ricker & Axt., 6115 Hudson Ave., West New York, 282 unit housing for elderly, Proj. NJ 9-11, $4,000,000.

▲ **N. J., New Brunswick**—ENGINEERING—Rutgers University, College Place, plans by Frank Grad & Son, 11 Commerce St., Newark, engineering, $12,000,000. CD 12/14.

▲ **Pa., Allentown**—CITY HALL—City, City Hall, city hall, $2,000,000. To go ahead 1962.

▲ **Pa. Doylestown**—COURT HOUSE ADDN., etc.—Comrs., Bucks Co. Doylestown, plans by Carroll Grisdale & Van Alen, 6 Penn Center Plaza, Phila., court house addn., and office, $3,000,000. Severud Elstad & Krueger 415 Lexington Ave., New York, N. Y., engrs. CD 12/26/56.

▲ **Tex., Austin**—STATE OFFICE—State of Texas, State Bldg. Comn., Office of State Comptroller, Main Admin. Bldg., plans by Kuehne, Brooks & Barr, 203 Perry-Brooks Bldg., Austin, and Golemon & Rolfe, 5100 Travis St., Houston, State Office No. 2, $3,000,000. Walter P. Moore, 2 Pinedale Place, Houston consult. engr. CD 1/8.

▲ **Tex., El Paso**—SCHOOL—El Paso Ind. School Dist., 100 W. Rio Grande St., voted bonds Apr. 2, Elementary School No. 1, $750,000; Elementary School No. 2, $675,000; Elementary School No. 3, $850,000; Junior High School unit, $1,550,000. Senior High School, $1,500,000; school addn., $500,000. CD 2/18.

▲† **Tex., Houston**—HOSPITAL—U. S. Govt. Veterans Admin., Munitions Bldg., Wash., D. C., plans by Wyatt C. Hedrick, 5201 Fannin St., and Harvin C. Moore, 2037 Lexington St., 6 story hospital. $3,500,000-$5,870,000. CD 8/1/58.

▲ **Va., Fairfax**—SCHOOLS, etc.—Bd. Supervs. Fairfax Co.,
Annandale Acres School, Annandale, $400,000.
Balls Hill Rd. School, Fairfax, $1,500,000.
auditorium-gymnasium adjoining Central High School, Fairfax, $750,000.
Chair Bridge School, Fairfax, $400,000.
Fort Hunt High School, Fairfax, $2,100,000.
Hayfield School No. 2, Fairfax, $400,000.
Hayfield School No. 1, Fairfax, $400,000.
Hollin Meadows School, Fairfax, $400,000.
Hybla Valley School, Fairfax, $400,000.
Langley Forest School, Fairfax, $400,000.
Lee Forest School, Fairfax, $1,500,000.
Legato School between Centreville and Fairfax, $400,000.
Lewisville Elementary School, $400,000.
Mt. Vernon School, $1,500,000.
Newington School, Fairfax, $400,000.
Pine Ridge School, Fairfax, $1,500,000.
Potomac School, Fairfax, $500,000.
Ravensworth School, Fairfax, $400,000.
Rose Hill High School, Fairfax, $2,750,000.
Springhill School, Fairfax, $400,000.
Stratford Landing School, Fairfax, $400,000.
Vienna School, $400,000.
Wakefield High School, Fairfax, $3,500,000.
Washington Mill School, Fairfax, $400,000.
high school, Tysons Corner, $2,500,000.
elementary school, Fairfax, $400,000.
Elementary School No. 1, Herndon, $400,000.
Elementary School No. 1 (West) Springfield, $400,000.
Elementary School No. 2, Herndon, $400,000.
Elementary School No. 2 (West) Springfield, $400,000.
School No. 4 (West) Springfield, $400,000.

▲ **Va., Fairfax**—SCHOOLS—Fairfax County Bd. Educ., plans by Dixon & Norman, 1103 E. Main St., Richmond, high school, Feltman Tract, $3,000,000. CD 5/11/59; plans by Pickett & Seiss, 110 Gordon Rd., Falls Church, high school, Vashina Tract, $2,000,000; plans by Dwight Chase, 618 N. Washington St., Alexandria, Mantua Elementary School, Pineridge Area, $400,000; plans by Pickett & Seiss, 110 Gordon Rd., Falls Church, Marshall Rd. Elementary School, $400,000.

▲ **Va., Richmond**—SCHOOLS—Henrico County School Bd., 21st and Main St., $9,500,000 bond election June 7, Central Gardens School, $600,000; high school, Varina Dist., $600,000; Va. Randolph School addn., $400,000; High School 1, $1,900,000; High School 2, $1,900,000; High School 3, $1,900,000 School C, $700,000; School D, $700,000; School E, $700,000; School F, $700,000. CD 3/14.

▲ **Wis., Madison**—JUNIOR HIGH SCHOOL—Bd. Educ. plans by Law, Law, Potter & Nystrom, 121 S. Pinckney, 3 story, bsmnt. Junior High School. $1,750,000.

COMMERCIAL BUILDINGS

▲ **Conn., Vernon**—HOUSES—U. & R. Constr. Co., Inc., 55 E. Center St., Manchester, 69 houses, Center Rd. $1,656,000.

▲ **D. C., Wash.**—SCHOOL OF RELIGION—Howard University, 2400 6 St. N.W., Wash., D. C., four School of Religion buildings, southeast corner Georgia Ave. and Fairmont St. N.W. $2,000,000. Financed by private funds.

▲ **Md., Seneca**—CLUBHOUSE, etc.—Tamarack County Club Corp., 2907 McCombs Ave., Kensington, plans by E. Ault, 11607 Grandview Ave., Wheaton, clubhouse, swimming pool, bowling alleys, golf course and tennis courts. $1,800,000.

▲ **Md., Silver Spring**—OFFICE—Murray Michael, c/o Ronald S. Senseman, archt., 7705 Georgia Ave. N.W., Wash., D. C., office, Colesville Rd. and Spring St. $1,500,000.

▲ **Mass., Andover**—SHOPPING CENTER—A. J. Tambone, Inc., 88 Main St., Reading, plans by Valtz & Kimberley, Inc., 820 Lynn Fells Parkway, Melrose, shopping center, near here. $5,000,000. Constr. 1960.

▲ **Mass., Worcester**—APARTMENT—Harry W. Kumpey, 182 Prescott St., will not construct APARTMENTS, Salisbury St. $2,000,000. Doak Martin, 8 Norwich St., archt. Project abandoned. CD 2/4/59.

▲ **N. J., Hackensack**—HOUSES—Interboro Holding Corp., 477 Main St., 47 one-family houses, Prospect Ave. $1,500,000. CD 2/18.

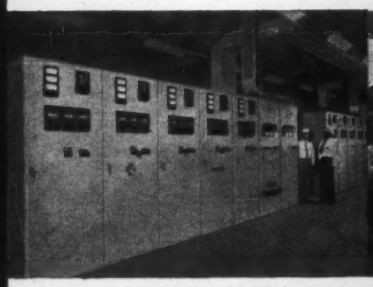
▲ **N. J., North Brunswick**—RESEARCH AND DEVELOPMENT CENTER—E. R. Squibb & Sons Div. of Olin-Mathieson Chemical Corp., George Rd., New Brunswick, and 745 5 Ave., New York, N. Y., research and development center, George Rd. $1,500,000.

▲ **N. Y., New York**—APARTMENT—Nancy Jane, Inc., 247-38 Jericho Turnpike, Bellerose, plans by Philip Birnbaum, 18 E. 48th St., Zone 17, 18 story apartment, 748-60 Second Ave. $1,900,000.

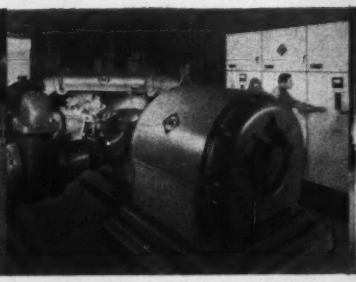
▲ **Tex., Austin**—DIVISION OFFICE—Southwestern Bell Telephone Co., 308 S. Akard St., Dallas, or 1121 Capitol Ave., P.O. Box 1780, Houston, plans by Page, Southerland & Page, 602 West Ave., Austin, division office. $2,000,000. CD 2/1.

(Continued on page 100)

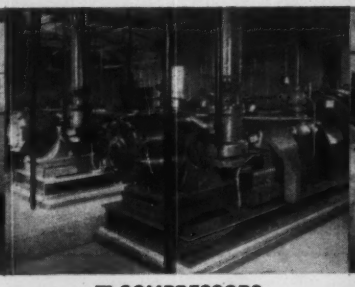
ALLIS-CHALMERS



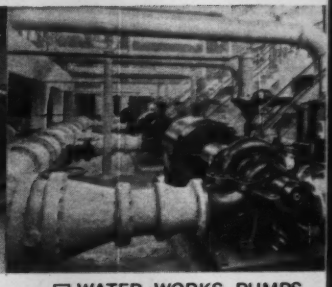
☐ SWITCHGEAR



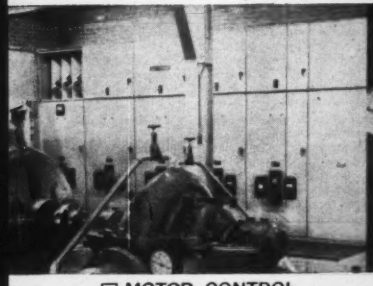
☐ ELECTRIC MOTORS



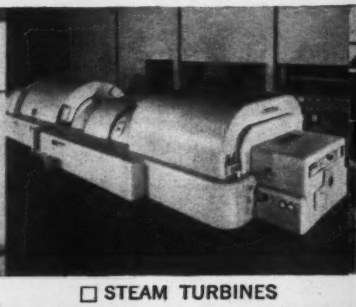
☐ COMPRESSORS



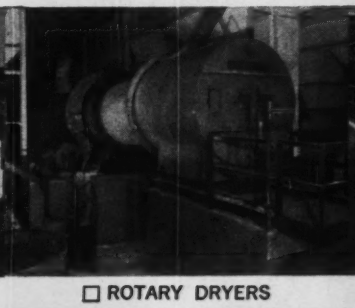
☐ WATER WORKS PUMPS



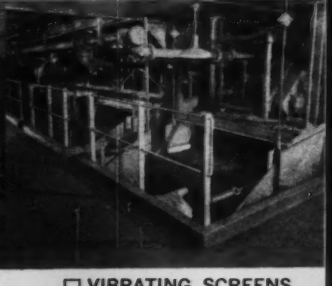
☐ MOTOR CONTROL



☐ STEAM TURBINES

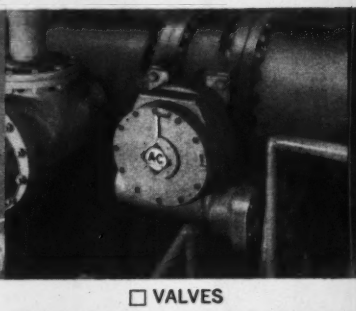


☐ ROTARY DRYERS

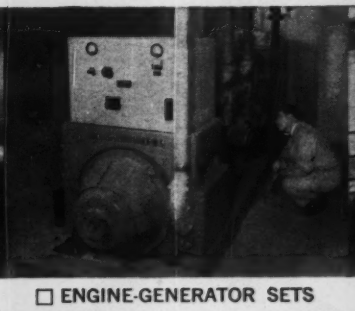


☐ VIBRATING SCREENS

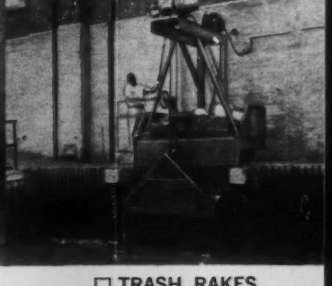
☐ SEWAGE PUMPS



☐ VALVES



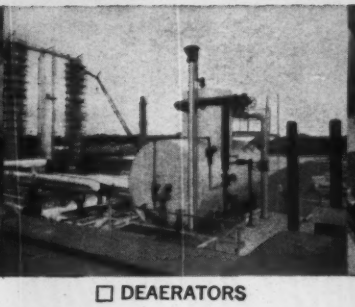
☐ ENGINE-GENERATOR SETS



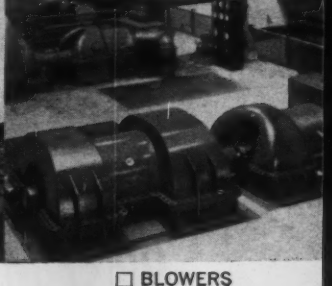
☐ TRASH RAKES

☐ TRACTORS

☐ COMPACTOR MILL



☐ DEAERATORS



☐ BLOWERS

Test your public service product "I.Q."

What's our line?

In addition to all the products shown above, there's another dozen* supplied by Allis-Chalmers. Whether you need equipment for sewage plants, water works, municipal power plants, or street and highway maintenance . . . Allis-Chalmers is your most convenient single source.

Municipalities all over the world have modernized, expanded and prospered with expert engineering and application help from Allis-Chalmers. *For complete details, call your nearby A-C office, or write* ***Allis-Chalmers,*** *Milwaukee 1, Wis.*

***Additional Public Service Products** — Transformers, condensers, circuit breakers, voltage regulators, substations, generators, vacuum pumps, sifters, engines, lift trucks, graders, and other earth moving equipment.

A-1311

Here's why you're money ahead

with A. O. Smith glass-protected smokestacks

- Now available in a variety of colors
- They last longer — as much as 3 to 5 times longer than unlined steel stacks — corrosion resistant regardless of excess condensate
- Glass is tough, durable — shows remarkable resistance to impact or abrasion
- Maintenance is low! There's no painting—glass can't rust
- Economical to install — no need for special equipment or highly skilled workmen

Write Dept. ENR-50 for full facts.

Through research . . . a better way

A.O.Smith
CORPORATION

SMOKESTACK SALES
PROCESS EQUIPMENT DIVISION
P. O. Box 584
Milwaukee 1, Wisconsin

CUT COSTS!

Blast Metal Away with ARCAIR

Here's metal removal to beat anything you've ever seen before! Arcair Torch cuts, gouges, grooves, bevels or flushes off *any* metal . . . does it faster, cheaper, through a revolutionary combination of the electric arc and ordinary compressed air.

Inexpensive to install, economical to operate, easy to use —Arcair works with any standard arc welding machine.

WRITE TODAY FOR COMPLETE INFORMATION!

Arcair **THE ARCAIR CO.**
472 S. Mt. Pleasant St.
Lancaster, Ohio

(Continued from page 98)

▲ **Tex., Dallas**—SHOPPING CENTER—Chas. S. Dilbeck, Martin Rodendroff & Associates, 3113 McKinney St., will not construct shopping center, $2,500,000; area earthwork, $60,000; area and auto center pavement, $100,000, 4 acre site on Preston Rd., north of Valley View. Project abandoned. CD 3/28.

▲ **Tex., Houston**—APARTMENT, etc.—C. O. Beeler Co., 910 Clay St., 12 story, air-conditioned apartment; $3,200,000; parking garage, $200,000, San Jacinto St.

▲ **Tex., Houston**—SHOPPING CENTER, etc.—G. M. George, Jr., 3520 Montrose Blvd., plans by Daniel Perkins & Associates, Baytown, 1 story, 74,000 sq. ft., masonry, air-conditioned mall, "Shoppers Park Shopping Center" $2,350,000; office, 2nd floor above shopping center, $410,000; site area earthwork, $65,000; area and 1500 auto center hard-paving, $100,000, Cullen Blvd. and Old Spanish Trail.

▲ **Tex., San Antonio**—MOTEL, etc.—John W. Lattimore, 1138 Basse Rd., plans by Burns Roensch Co., archt.-consult. engr., 1138 Basse Rd., 200-unit motel, $1,500,000; site earthwork, $65,000; paved-auto center and shelter, $100,000. CD 4/20.

▲ **Tex., San Antonio**—MOTOR-HOTEL—Milner Enterprises, R. Dumas Milner, pres., 1090 Milner Bldg., Jackson, Miss., plant by Tom E. Stanley, 904 Fort Worth Ave., Dallas, and 1400 T&P Bldg., Fort Worth, 6 story, motor-hotel, $5,000,000; 4 level open deck auto parking, $250,000; garden, park patio and pools, $100,000; outside lighting sys., $90,000, at Lexington Ave. and San Antonio River area. Beretta, Greenslade & Associates, Inc., 1927 N. St., Marys St., San Antonio, consult. engr. CD 1/12.

▲ **Tex., San Angelo**—HOSPITAL, etc.—Shanon West Texas Memorial Hospital, 9 S. Magdalen St., plans by Thomas, Jameson & Merrill, Trinity Universal Bldg., Dallas, 6 story hospital and remodeling, $2,100,000. Tippett & Gee, 1333 N. 2nd St., Abilene, consult. engrs. CD 8/10.

▲ **Utah, Logan** — STAKE HOUSE, etc. — Latter Day Saints Church Bldg. Com., 47 E. So. Temple, Salt Lake City, Zone 11, stake house and residence hall. $2,000,000.

▲ **Wash., Seattle**—SHOPPING CENTER—Skinner Corp. and L. Smith & Co., 723 Central Bldg., Zone 4, shopping center, W. Barton St. and 25 Ave. S.W., $2,000,000. Constr. this year. J. Graham & Co., 1426 5 Ave., Zone 1, consult. engr.

▲ **Que., Montreal**—SCHOOL—School for Crippled Children, 1585 Cedar Ave., school for crippled children, $3,500,000.

▲ **Que., Montreal** — SCIENCE — Loyola College, 7174 Sherbrooke St. W., science, $2,000,000 (Correction—architects and engineers not selected). CD 4/20.

INDUSTRIAL BUILDINGS

▲ **California**—PENSTOCK, TURBINE GENERATOR UNIT —Pacific Gas & Electric Co., 245 Market St., San Francisco 6, penstock, turbine generator unit, DeSabla Power Plant, Butte Creek near Paradise, Butte Co. $3,500,000.

▲ **California**—POWER PLANT—Pacific Gas & Electric Co., 245 Market St., San Francisco, Zone 6, Morro Bay Power Plant addn., incl. 325,000 kw. generator, San Luis Obispo Co. $40,000,000. To go ahead 1961.

▲ **Ill., Moline**—PLANT ADMINISTRATIVE OFFICES—John Deere & Co., 1325 Third Ave., plans by Eero Saarinen & Assocs., 1300 Woodward St., Birmingham, Mich., four plant administrative offices, southwest of here, $12,000,000. Bids about June. CD 8/21/57.

▲ **Ill., Northlake**—WAREHOUSE, etc.—The Kroger Co., 1041 Vine St., Cincinnati, O., plans by Hixon Tarter & Assocs., 2306 Park Ave., Cincinnati, O., 475,000 sq. ft., chain store warehouse and distribution center, Proviso Industrial Park. $4,000,000.

▲ **Ky., Catlettsburg**—PLANT—Ashland Oil & Refining Co., 1409 Winchester Ave., Ashland, plant for production of napthalene and benzene for plastics and synthetic rubber. Over $5,000,000.

▲ **Mo., Joplin** — CHEMICAL PLANT — Solar Nitrogen Chemical, Inc. (Atlas Powder Co., New Murphy Rd. and Concord Park and Standard Oil Co. of Ohio, Midland Bldg., Cleveland, O.), chemical plant to produce anhydrous ammonia, urea and related products. $15,000,000.

▲ **Pa., Doylestown** — INDUSTRIAL PARK — Wireforms, Inc., 106 20 Atlantic Ave., Ozone Park, N. Y., 124-acre industrial park development. Over $5,000,000.

▲ **Pa., Paoli**—INDUSTRIAL PARK—Wilbur C. Henderson & Son, 6525 Upland St., Phila., 300 acre industrial park to be developed, Chester Co. Over $5,000,000.

▲ **S. C., Greenwood**—PLANT ADDN.—The Chemstrand Corp., 350 Fifth Ave., New York, N. Y., nylon plant addn. $7,500,000.

▲ **Tex., Alvin**—CHEMICAL PLANT—Monsanto Chemical Co., Lindberg St. and Olive Rd., chemical plant, $18,000,000.

▲ **Ont., Sarnia**—PLANT—Rexall Drug Co. Ltd., 8480 Beverly Blvd., Los Angeles, Calif., U. S. A., plastics plant, Churchill Rd. and Scott Rd. and Scott Rd., $2,000,000.

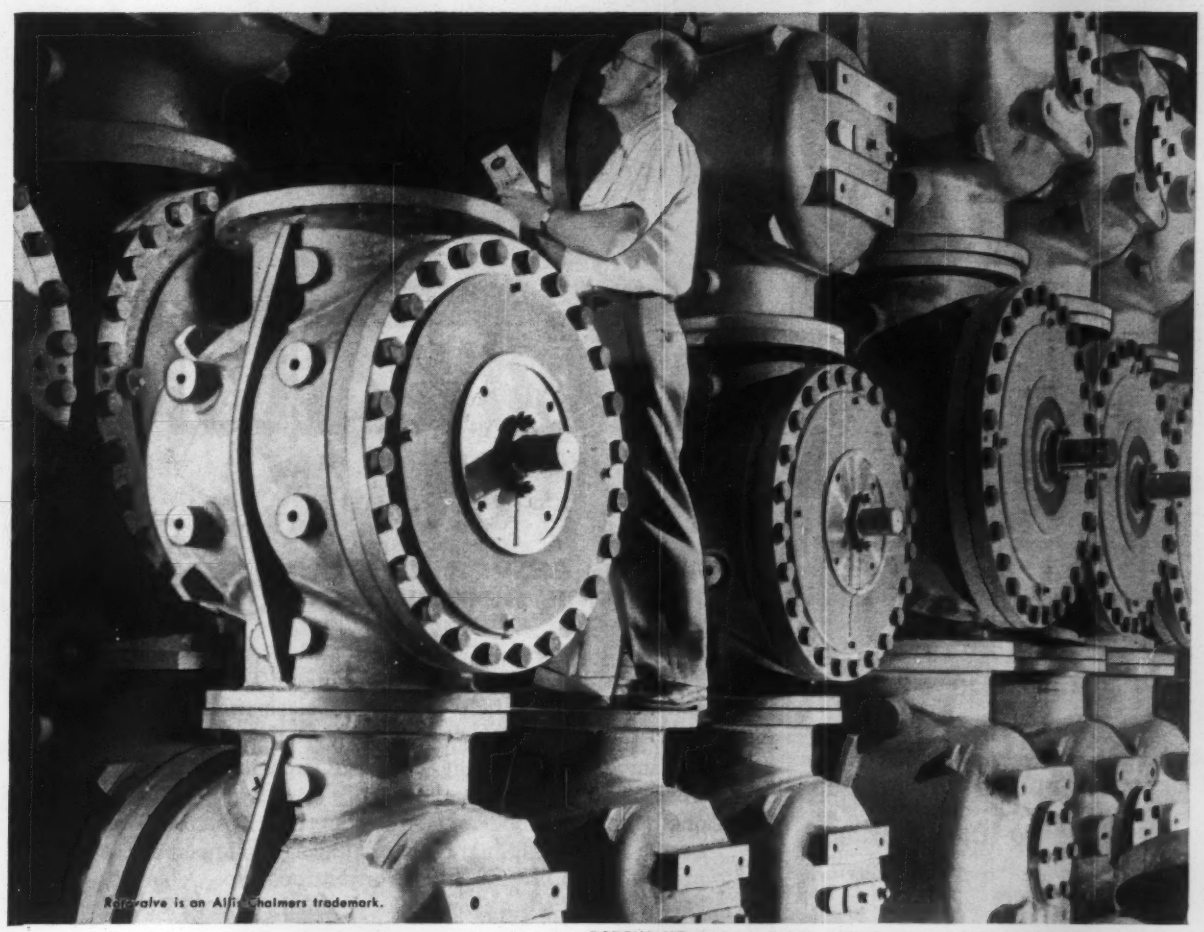
▲ **Sask., Hudson Bay**—PLANT—Wizewood Ltd., 5 Aaron Bldg., Prine Albert, plans by C. B. Archibald & Assoc., archts.-consult. engrs., 6787 E. Hastings, Vancouver, B. C., waferboard plant, $2,500,000. Bids in July.

UNCLASSIFIED

▲ **Ky., Brandenburg**—LAKE RESORT, etc.—L. H. Callaway Co., 616 East Broadway, Louisville, Zone 2, lake resort and dam created by damming Doe Run and creation of 55 acre Lake Tract, etc., near here. Over $1,000,000.

ALLIS-CHALMERS

A-1260



ROTOVALVE stocks at A-C York Works save months of delay for customers.

Another Allis-Chalmers time-saving exclusive:

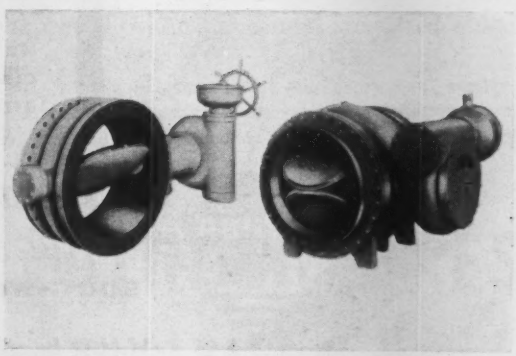
Cone valves "right off the shelf!"

Six to thirty-inch *Rotovalve* units — awaiting your call. Think of the valuable time you save! Typical is the case of a western municipality that recently needed one 24-inch and three 20-inch *Rotovalve* units for their waterworks. Allis-Chalmers assembled all accessories required, completed testing and shipped the valves to customer in less than three weeks! Compare this with the 3 to 6 months normally required by other suppliers for delivery.

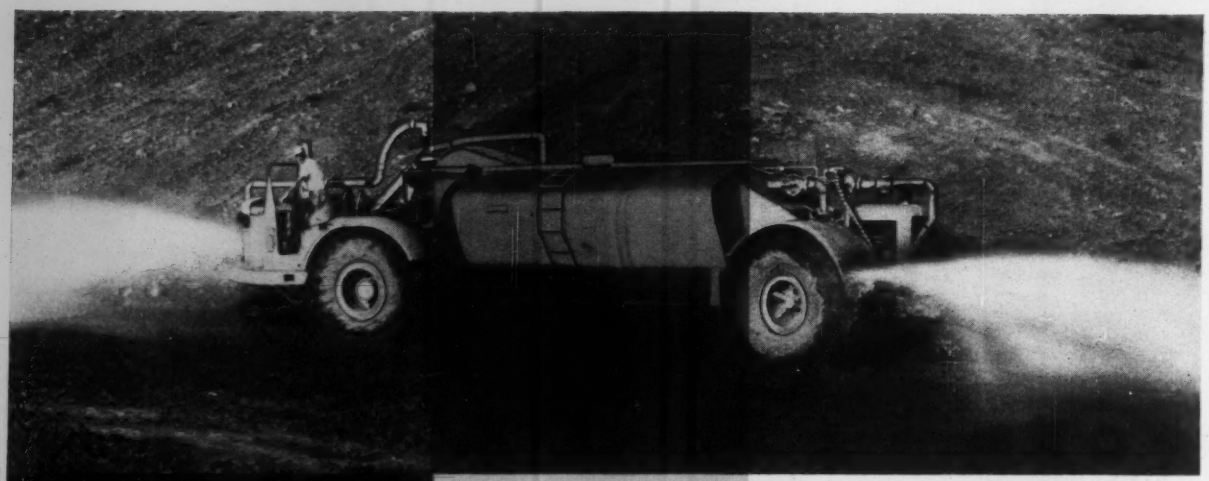
Perpetual off-the-shelf inventory of *Rotovalve* units, butterfly and ball valves gives Allis-Chalmers today's only complete rotary valve-stocking program . . . guarantees fastest deliveries to you.

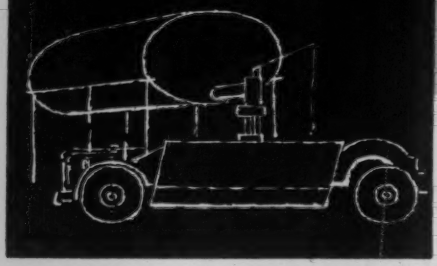
Avoid troublesome, costly delays and get the valves you need to do the job right. For immediate assistance anytime, call your nearby A-C valve representative, district office or write **Allis-Chalmers,** Hydraulic Division, York, Pa.

Rotovalve is an Allis-Chalmers trademark.



Standard butterfly and ball valves illustrated are also available from stock in a broad range of sizes.





10,000 GALLONS AT A CRACK!

...MEANS FEWER TRIPS TO WATER-UP, MORE TIME SPRINKLING

Yuba-Southwest big gallonage sprinkler tanks cut costs, speed up the job: sizes up to 10,000 gallons

Yuba-Southwest also manufactures
MULTIPLE-BOX COMPACTION ROLLERS
SELF-PROPELLED ROLLERS
SHEEPSFOOT ROLLERS

Yuba-Southwest Semi-Trailer Sprinkler Tanks are designed and engineered to help contractors slash time and costs watering down big earthfills.

They are built in big-gallonage capacities only, ranging from 5,000 to 10,000 gallons, to reduce by as much as one-half the number of non-productive trips to the water source for tank filling. This minimizes a manpower cost problem ever present when conventional "piggyback" gasoline-type sprinkling tanks of small 2,000 to 3,000 gallon capacity are used.

Equipped with large, high-flotation, low-pressure tires, these big Southwest Sprinkler Tanks can work way out on deep, soft fill without losing traction or bogging down. With pressure spray bars both front and rear, and gravity bar under the tank, they provide faster area coverage with greatest possible water penetration.

Yuba-Southwest Sprinkler Tanks are adaptable for use with Caterpillar DW-21, DW-20 and DW-15 Tractors and other suitable prime movers. Various draft beam or hitch arrangements are available. Get complete information—today.

YUBA

specialists in compaction equipment

Yuba Southwest Products are Sold and Serviced by Your Caterpillar Dealer

SOUTHWEST WELDING & MANUFACTURING DIVISION

3201 W. Mission Road, Alhambra, Calif.

YUBA CONSOLIDATED INDUSTRIES, INC.

Third of a Series

TIRE TALKS

On the record—off the road

Leading U. S. Rubber scientists and engineers answer questions on recent advances in off-the-road tires for which they were in a large measure responsible

Q The lug-type tires on our logging arches deliver poor lateral traction. Chains and limbs catch in the lugs. Sidewall gouges often cause early tire failure. What can be done?

Mr. C. F. Engstrom, manager of off-road tire development. He and his staff of engineers have been instrumental in introducing many highly technical advances and innovations in specialized U. S. Royal tires.

A These problems are common to many logging operators. To solve them, U.S. Rubber developed a superior Logging Arch tire. Its straight-rib design not only provides good lateral traction but does not snag chains and limbs. For protection against gouging, cutting and snagging, this tire has a virtually impenetrable mat of exclusive Steel Reinforcement (S.R.T.*) beneath both tread and sidewall. This mat consists of layers of rubber containing hundreds of thousands of short, hardened steel filaments. Again, custom engineering and development of tires for specific equipment and operating conditions have paid off in improved performance and increased safety.

DO YOU HAVE A QUESTION? U. S. Royal development engineers have custom-engineered many tires and special constructions to meet specific conditions or to overcome high tire or shut-down costs on specialized operations. You are invited to consult with Mr. Engstrom if you are seeking a solution to an individual tire operating problem. Write to him at

U.S. ROYAL SAFETY 1ST TRUCK TIRES

United States Rubber

1230 Avenue of the Americas, New York 20, New York

Bids—Low Bids—Contracts—Second Section

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., Oceanside**—SCHOOL—BA 6/1—Bd. Educ. Unif. School Dist. No. 11, Town of Hempstead, 1, 2 and 3 story, 140,000 sq. ft. brick, concrete block, steel Walter S. Boardman School. $2,800,000. Plans deposit $75, general, $50, mechanical trades. Knappe & Johnson, 2110 Northern Blvd., Manhasset, archts. Joseph R. Loring, 101 W. 47th St., New York, mechanical engr.

BUILDINGS—LB & CA

▲ **Diesel Constr. Co., Inc.**, 4 W. 58th St., New York, N. Y., CA Est. **$9,500,000**, 21 story River View MOTOR HOTEL, incl. 5 story, bsmnt. GARAGE, 2 penthouses, swimming pool, ice skating rink, 12th Ave., W. 42nd and W. 43rd Sts., NEW YORK, N. Y. Glickman Corp., 565 5th Ave., New York, N. Y. Morris Lapidus, Kornbluth, Harle & Liebman, 256 E. 49th St., New York, N. Y., archts.

▲ **John McShain, Inc.**, 3501 Sinclair Lane, Baltimore, Md., LB **$3,838,700**, (12 bidders), North Arundel HOSPITAL, GLEN BURNIE, MD. North Arundel Hospital Assoc., 110 Crain Hy. N., Glen Burnie, Md. Bids May 3. CD 3/11.

SOUTH

BUILDINGS—BA

▲ **Tenn., Chattanooga**—HOUSING—BA 5/28—Chattanooga Housing Auth., 192 housing units, S. Market St. $2,000,000. CD 1/16/53.

▲† **Va., Fort Eustis**—HOUSING—BA 5/26—U. S. Eng., foot of Front St., Norfolk, 223 units Capehart Housing, ENG-44-110-60-18. $3,495,000. Extended date. CD 4/13.

BUILDINGS—LB & CA

▲ **Foster Wheeler Corp.**, 6300 Bowling Green St., Houston, Tex., CA **$4,450,000**, design and construct BUTADENE PLANT ADDN., BATON ROUGE, LA. Copolymer Rubber & Chemical Co., Shada Ave., Baton Rouge, La. CD 2/25.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Wis., Milwaukee**—BA 5/24—Metropolitan Sewerage Comm. of County of Milwaukee, P. O. Box 2079, Milwaukee, Zone 1, 6,616 ft., 144 in. mono. concrete main sewer in S. Pennsylvania Ave. from Puetz Rd., to 1200 N. of Drexel, Oak Creek, $3,000,000. Plans deposit $10. Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago 6, Ill., consult. engrs. Raymond D. Leary, c/o owner, ch. engr. (Contractor refused award of contract claiming an error in his bid). CD 2/2, under CA.

HEAVY CONSTRUCTION—LB & CA

▲ **Contracting & Material Co.**, 1235 Dodge St., Evanston, Ill., CA Est. **$10,000,000**, 75 mi. 30 in. pipe line from Troy Grove near LaSalle to LaGrange, ILLINOIS. Northern Illinois Gas Co., 615 Eastern Ave., Bellwood, Ill.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲† **Tex., Abilene** — OPERATIONAL BASE MISSILE LAUNCH COMPLEXES—BA 5/26—U.S. Eng., Wooten Hotel Ballroom, 1102 N. 3 St., WS-107 A-1 operational base missile launch complexes near Dyess Air Force Base, Inv. No. ENG-41-443-60-30. $10,000,000. Plans deposit $10. Bechtel Corp., 220 Bush St., San Francisco, Calif., engrs. CD 4/20.

BUILDINGS—BA

▲ **Mo., St. Louis County**—HOSPITAL—BA 6/1—Sisters of Mercy, St. John's Hospital, 307 S. Euclid Ave., St. Louis, Zone 10, 12 story main hospital, central tower, 11 story nurses' home and school, convent, chapel, gymnasium, power plant and laundry, Ballas and Conway Rds. Over $10,000,000. Bernard F. McMahon, 111 S. Meramec Ave., Clayton 5, Mo., archt. Louis Krasner and Hale & Harvie, 915 Olive St., St. Louis 1, Mo., structural engrs. Van & Vierco, 7908 Bonhomme, Clayton 5, Mo., electrical engrs. Delaney, Sheldon & Assocs., 4908 Delmar Blvd., St. Louis 8, Mo., engrs. CD 12/24/58.

HEAVY CONSTRUCTION—LB & CA

▲† **Graver Tank & Mfg. Co., Div. Union Tank Car Co.**, and **Western-Knapp Engineering Co., Division, Western Machinery Co.**, 4809 Todd Ave., East Chicago, Ind., CA **$8,094,200**, constr. 7 horizontal steel penstocks and 14 steel surge tanks for Oahe Reservoir, near Pierre, CIVENG 25-066-60-65, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids. Apr. 18. CD 4/18, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Calif., Los Angeles**—BA 6/8—Metropolitan Water Dist. of Southern Calif., 306 W. 3rd St., constr. expansion No. 2 F. E. Weymouth Memorial Softening and Filtration Plant for Colorado River Aqueduct, LaVerne. $7,000,000.

HEAVY CONSTRUCTION—LB & CA

▲ **Guy H. James Constr. Co.**, P.O. Box 9575, Oklahoma City, Okla., LB **$3,607,200** (11 bidders), Upper American River Project: 13 ft. diameter unlined 17,000 ft. Robbs Peak Tunnel Unit, Inv. No. 2214, SACRAMENTO, CALIF. Sacramento Municipal Utility Dist., Engineering Dpt., 1708 59th St., Sacramento, Calif. Bids May 3. CD 4/6.

BUILDINGS—LB & CA

▲ **Cawdrey & Vemo**, 3601 Fremont Ave., Seattle 3, Wash., CA **$3,235,039**, RETIREMENT HOME ADDN., DES MOINES, WASH. Wesley Gardens Corp., Des Moines, Wash. CD 9/3.

▲ **Lease Co., Inc.**, 1501 N. 35th St., Seattle 3, Wash., LB **$5,827,000**, (2 bidders), MENTAL HOSPITAL, ANCHORAGE, ALASKA. State Dpt. P. Wks., Juneau, Alaska. Olsen & Sands, 109 West 3rd, Juneau, Alaska, archts. Bids Apr. 27. CD 3/21.

CANADA

BUILDINGS—LB & CA

▲ **Commonwealth Constr. Co., Ltd.**, 120 5 Ave., S.E., Calgary, Alta., CA **$4,000,000**, 14 story ELVEDEN HOUSE addn. 7 Ave. and 7 St. S.W., CALGARY, ALTA. British Pacific Bldg., Ltd., 526 12 Ave. S.W., Calgary, Alta. Awarded Apr. 27. CD 4/7.

▲ **Poole Constr. Co., Ltd.**, 2402-2a St. S.E., Calgary, Alta., CA Est. **$4,500,000**, STEAM GENERATOR PLANT expansion, WABAMUM LAKE, ALTA. Calgary Power Ltd., 140 1st Ave. S.W., Calgary, Alta.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Greece**—AIRFIELD—BA 6/1—Minister P. Wks., 9 Lycurgus St., Athens, airport. $10,500,000. Eero Saarinen & Assocs., 1300 North Woodward Ave., Birmingham, Mich., U.S.A., archts. Ammann & Whitney, 111 Eighth Ave., New York 11, N. Y., U.S.A., engrs. CD 3/30.

BUILDINGS—BA

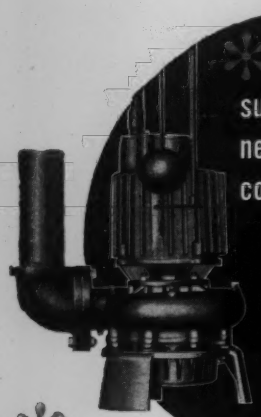
▲ **Morocco, Safi**—PLANT—Bids until July-Bureau des Etudes et Participations Industrielles, 8 Rue Michaux Bellaire, Rabat, superphosphate plant. $14,000,000. CD 2/17.

HEAVY CONSTRUCTION—LB & CA

▲ **African Constr. Co., Ltd.**, 261 Heemraadesingel, Rotterdam, The Netherlands, CA Est **$8,000,000**, mine structures, houses, railroad bridges, ore storage, transshipment facilities, power stations and shops, dredging, SIERRA LEONE, and LIBERIA. National Iron Ore Co., Monrovia, Liberia.

(Proposal Advertisements see pp. 119 to 121)

DEMING DEMERSIBLE SUMP PUMPS



Can be totally submerged without need of long support column or drive shaft.

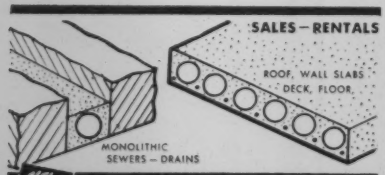
Compact, and versatile. Pump controls can be positioned at any convenient location. Motor completely sealed to exclude moisture.

Just one of the many Deming pump features that provide longer life and lower operating costs

Ask for a recommendation on your next project.

The DEMING Co.

504 BROADWAY • SALEM, OHIO



NEW! VOIDS IN CONCRETE with ELGOOD INFLATABLE VOID FORMS

REUSABLE RUBBER VOID FORMS FOR SEWERS, SLABS, DRAINS & DUCTS. SUPERSEDES ALL VOID FORMING TECHNIQUES.

- ALL DIAMETERS ¾" TO 120"
- GUARANTEE MINIMUM OF 100 USES Field experience, 250-3000 uses
- STAFF AVAILABLE FOR SPECIALIZED PROBLEMS

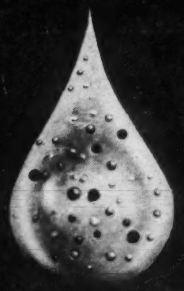
ELGOOD CONCRETE FORMS CORP.
378 TEN EYCK ST., BROOKLYN, N.Y. HY 7-5445

TUNNEL EXCAVATORS
CUT UP TO 45 LINEAL FEET OF TUNNEL IN 8 HOURS!

Consistently excavate 30 Lineal feet of 10' 6" Dia. tunnel in 8 hours in Chicago sewers. Designed for clay, earth and shale.

MAYO
TUNNEL AND MINE EQUIPMENT
Lancaster, Penna.

BETTER CONCRETE THROUGH DISPERSION CHEMISTRY



WRDA

WATER REDUCING AGENT

on the job at O'Hare Airport

At O'Hare International Airport in Chicago, new jet runway measures 8,860 x 200 feet. Job completed in 1959 required some 100,000 yards of concrete over a surface of 139,000 square yards.

WRDA, Dewey and Almy's research-developed water reducing agent, used on aprons, helped speed the job in a special way.

By making concrete place freely with less water in the mix WRDA produced higher strengths . . . permitted equipment to roll on new concrete sooner for easier placement of parallel strips.

Dewey and Almy's air entraining agent also was specified throughout the job.

W. R. GRACE & CO.
DEWEY AND ALMY CHEMICAL DIVISION
Cambridge 40, Mass. • Chicago 38, Ill.
San Leandro, Calif. • Montreal 32, Canada

DEWEY AND ALMY ADMIXTURES

designed to fit particular concrete needs

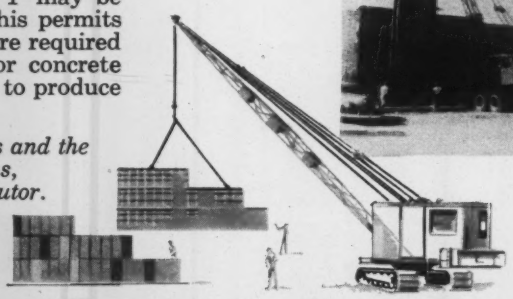
DAREX AEA provides controlled air entrainment, greater durability

reduces water content, increasing concrete strength

DARATARD gives controlled retardation of initial set

AIRBORNE UNI-FORM PANELS

smart way to speed concrete forming...



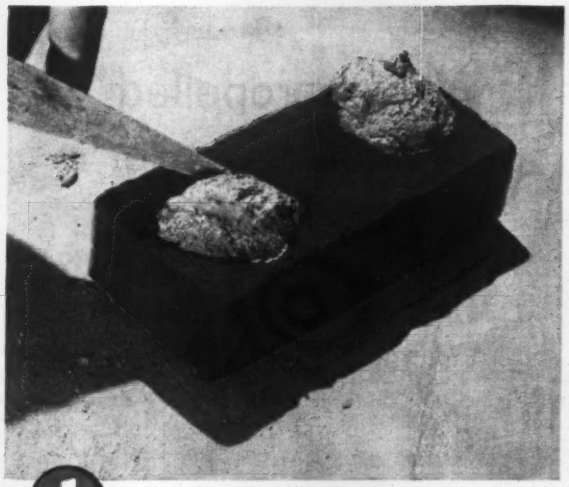
Forming speed and economy can be greatly increased by crane handling big monoliths of UNI-FORM Panels. Contractors with repetitive section forming requirements are finding that the design of UNI-FORM Panel monoliths—in which metal filler angles are used between each panel—give them greater versatility and wider application. For example . . . tie rods of any size from ½" to 1" may be used to tie two monoliths into a wall form. This permits using the right tie size for the job. Fewer ties are required and sections can be placed, tied and ready for concrete faster. Panels may be added or removed at will to produce any monolith required.

For complete information on UNI-FORM Panels and the UNI-FORM System in crane handling operations, write today, or ask your nearby Universal Distributor.

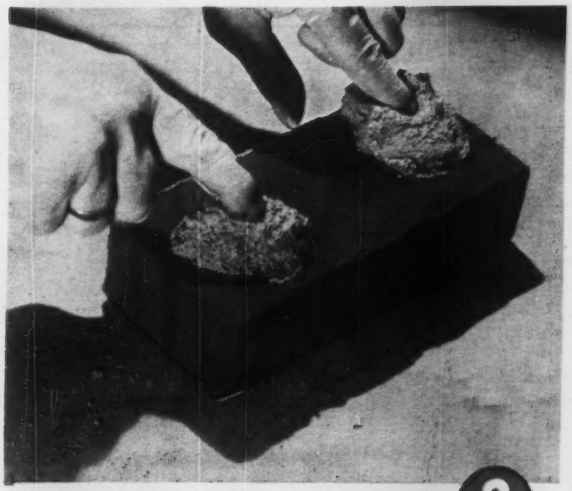
"Products from the Gold Tool Room"

UNIVERSAL FORM CLAMP CO. 1238 N. KOSTNER AVENUE • CHICAGO 51, ILLINOIS

BRANCH OFFICES and WAREHOUSES:
ATLANTA BALTIMORE CLEVELAND HOUSTON
LOS ANGELES SAN LEANDRO TORONTO



1 Place a dab of Brixment mortar and a dab of 50-50 cement-and-lime mortar on a brick or concrete block. Wait a minute, then feel each mortar.



The mortar that stays plastic longer will be the one having the highest water retention. *Notice the greater plasticity of the Brixment mortar!* 2

BRIXMENT mortar has better WATER-RETENTION!

Water retention is the ability of a mortar to retain its moisture longer, and hence its plasticity, when spread out on porous brick or block.

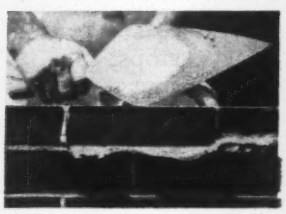
Because of its inherent physical characteristics, plus the air-entraining agent intermixed into Brixment during manufacture, Brixment mortar has very high water-retaining capacity. It resists the sucking action of the brick. It gives the bricklayer more time to bed the brick properly before the mortar stiffens, thus helping to secure *a good bond.*

But greater water retention is only *one* of the characteristics in mortar necessary to produce top-quality masonry at lowest cost. Several others are listed below—and *no other mortar combines ALL these characteristics to such a high degree as Brixment mortar.*

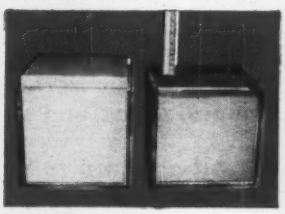
It is this combination of advantages that makes Brixment superior to any mixture of portland cement and lime—and which also accounts for the fact that Brixment has been the leading masonry cement for over 40 years.

Louisville Cement Company, Louisville 2, Ky.

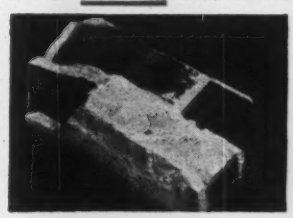
BRIXMENT MORTAR ALSO COMBINES THESE 8 OTHER ESSENTIAL CHARACTERISTICS



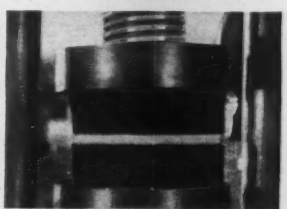
PLASTICITY



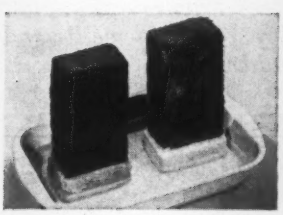
YIELD



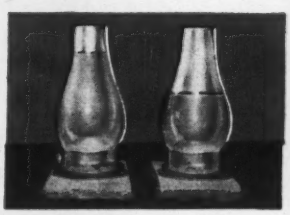
BOND



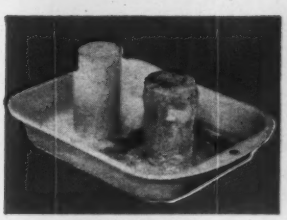
STRENGTH



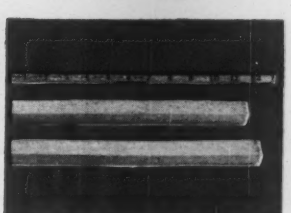
LOW EFFLORESCENCE



IMPERMEABILITY

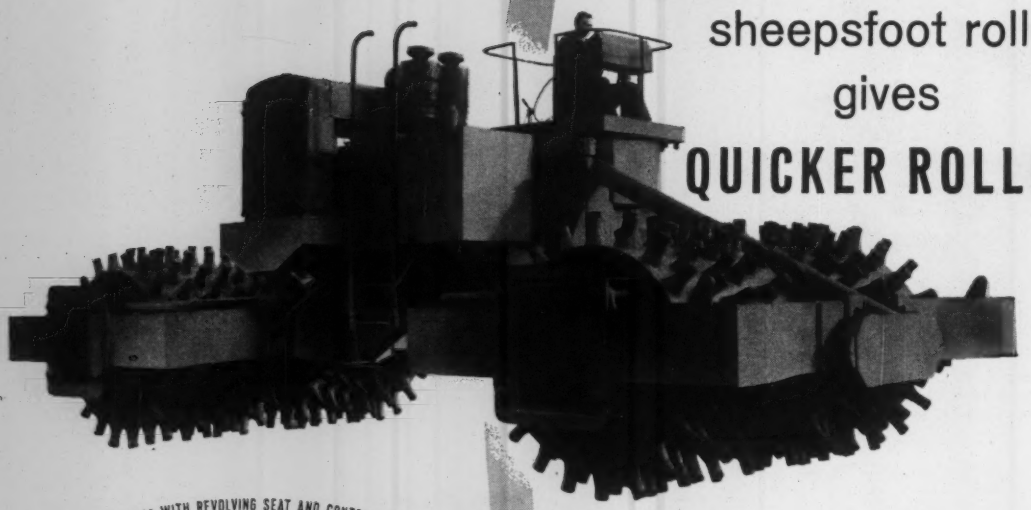


DURABILITY

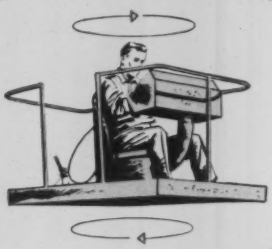


SOUNDNESS

NEW self-propelled sheepsfoot roller gives QUICKER ROLLOUT



SWING 180° WITH REVOLVING SEAT AND CONTROL PANEL



GET "STRAIGHT AHEAD" OPERATION IN EITHER DIRECTION.

save 1½¢ (or more) per cu. yd.

with SERIES M 50-55

POWER PACKER

You'll be amazed at the *extra miles* of compacting you'll get hour after hour, day after day, with Series M 50-55 Power Packers! The reason is simple: This self-powered "sheepsfoot roller" works at a pace appreciably faster than its towed counterparts; and *you never turn around on the fill.*

More power is available for compacting because the Power Packer has to move no "idle" weight of a tow tractor. Each of its four roller drums is driven from the inside by its own electric motor and gear reduction. A diesel-electric generating plant automatically synchronizes the rollers at any of the infinite number of speeds you can select within the range.

Then, to travel in the other direction, merely swing the rotating seat and controls 180-degrees, spin a rheostat, and you're rolling! These quick-as-a-flash starts, stops, and reverses make working tight corners, or over slopes, quick and simple.

ELECTRIC DIGGER (Series L-50) is another Electric Wheel machine for contractors. It self loads 55 to 60 tons . . . drastically cuts dirtmoving cost.

It all adds up to more production per man hour — the surest way to stay competitive . . . and profitable. Learn how present owners are making Power Packers pay. Just let us know you're interested, and we'll send all the specifics. The address is:

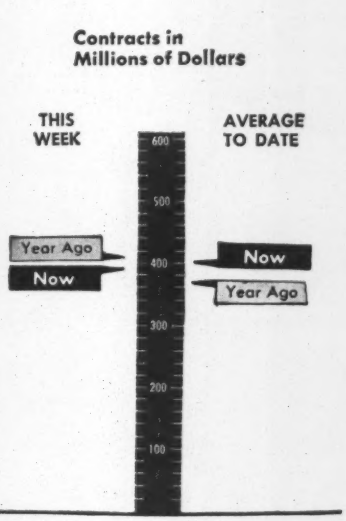
R.G. LETOURNEAU INC

2725 S. MacArthur, Longview, Texas

E106

Construction Scoreboard

This Week...



AMOUNT OF CONTRACTS LET

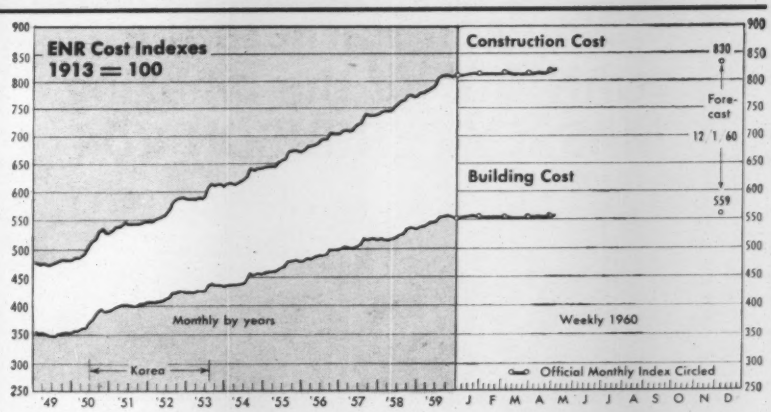
Contracts Awarded In 50 States By Type	This Week	Cum. 19 wks 1960	Chge '59-'60 %
	millions		
All Heavy Construction	$385.8	$7,590.2	+ 9
By Ownership			
PRIVATE	206.0	4,066.9	+23
PUBLIC	179.8	3,523.3	− 3
State & Municipal	140.6	2,683.3	+ 4
Federal	39.2	840.0	−22
By Type of Work			
PUBLIC			
Waterworks	9.1	166.7	+ 9
Sewerage	6.4	194.4	−12
Bridges*	11.3	337.4	+59
Highways	73.3	1,073.7	+ 3
Earthworks, Dams & Waterways	28.7	258.9	−11
Buildings:			
Excl. Housing	31.5	821.7	−12
Housing	4.2	181.1	−24
Unclassified	15.3	490.6	−12
PRIVATE			
Buildings:			
Mass Housing	72.9	2,019.3	+40
Commercial	18.7	754.7	− 7
Industrial	86.1	924.7	+ 2
Unclassified	28.3	367.0	+149

*Includes Private Bridges

NOTE: Minimum size products included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of May 5	Cum. 18 wks 1960	Chge '59-'60 %
	millions		
Corporate Securities	$ 56.4	$ 998.0	−23
State and Municipal:			
All Except Housing	191.9	2,385.5	− 3
Housing	....	13.6	−56
Federal Loans	2.6	60.6	+26
Federal Aid	2,688.7	2,717.8	....
Total Nonfederal	$2,939.6	$6,175.5	+61
Federal Appropriations:			
Projects in U. S.	2.0	5.2	....
Outside U. S.	6.8	6.8	....
Total New Capital	$2,948.4	$6,187.5	+61



ENR INDEXES (1913=100), 20-cities' average	Week of May 5 1960	% Change from Apr. 7 1960	% Change from May 7 1959
Construction Cost	821.23	+0.69	+3.86
Building Cost	557.78	+0.10	+2.31

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

Latest Month . . .

CONTRACTS AWARDED

	1960 April (millions)	1960 4-Mos. (millions)	Percent Change from 1959 Apr.	Percent Change from 1959 4-Mos.
Total U. S. (50 States)	$2,005.3	$6,674.0	+ 3	+43
Private	1,150.1	3,625.8	+34	+16
Public	855.3	3,048.2	−21	−11
State and Municipal	697.5	2,333.0	− 3	− 3
Federal	157.8	715.1	−56	−30
ENR Volume Index, 1913=100	696	537	+31	+ 5

NEW CONSTRUCTION CAPITAL

Total U. S.	829.9	3,239.0	−37	−15
State and Municipal Bond Sales	506.9	2,207.2	−40	−11
Corporate Security Sales	280.8	941.5	−38	−27
Federal Loans, Aid (nonfederal work)	39.0	87.1	+100	+82
Federal Appropriations, (federal work)	3.2*	3.2	....	....

* Includes funds for outside U. S.

MATERIALS SHIPMENTS

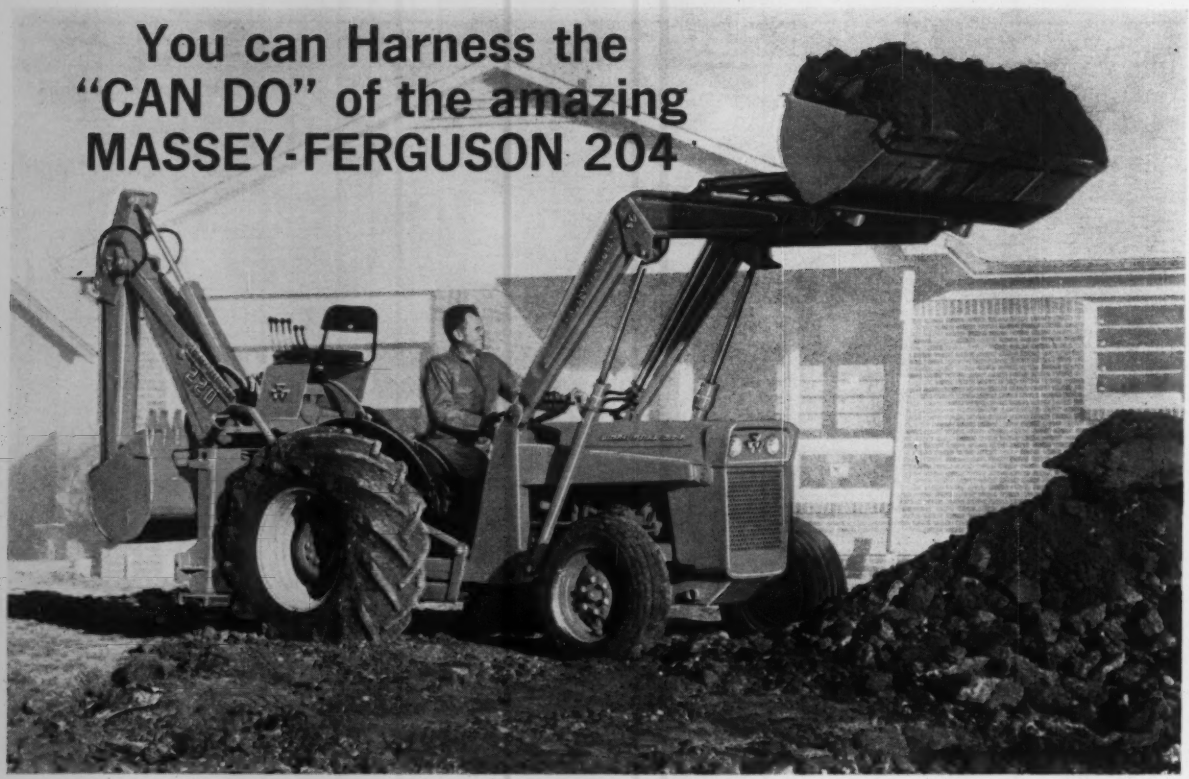
	1960 Jan. (J) Feb. (F) Mar. (M)	Cum. (No. of Mos.)	Percent Change from Year Ago Mo.	Cum.
Portland Cement, Bur Mines, thous bbls	17,681(M)	44,023(3)	−23	−16
Concrete Paving Awards, PCA, thous sq yd	7,826(M)	21,197(3)	+ 8	− 8
Fabricated Structural Steel, thous tons	277(M)	727(3)	+ 6	+ 4
Bookings, AISC, thous tons	343(M)	853(3)	+35	+ 9
Reinforcing Bars, Net, AISI, thous tons	145(F)	170(2)	−33	− 5
Lumber, NLMA, mil fbm	2,798(F)	5,396(2)	+ 4	+ 2
Orders, mil fbm	2,787(F)	5,491(2)	+ 2	− 2
Production, mil fbm	2,924(F)	5,605(2)	+11	+ 6
Clay Products, Bureau of Census				
Brick, Unglazed, Common, Face, mil bri	352.0(J)	352.0(1)	− 4	− 4
Vitrified Clay Sewer Pipe, thous tons	109.2(J)	109.2(1)	+ 8	+ 8
Structural Tile, Unglazed, thous tons	34.3(J)	34.3(1)	−10	−10
Asphalt Products, Bureau of Census				
Asphalt Roofing, thous sales sqs	3,321.8(F)	5,953.6(2)	− 1	− 2
Asphalt Siding, thous sales sqs	63.3(F)	115.6(2)	− 5	− 4
Aluminum, Wrought, Net, Bur Census				
Sheet and Plate (non-heat treatable), mil lbs	101.3(F)	197.8(2)	+21	+17
Wire and Cable, mil lbs	22.6(F)	45.1(2)	+ 4	− 7
Extruded Shapes (soft alloys), mil lbs	65.9(F)	131.4(2)	+13	+11

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS, thous	2,273(M)	2,372(3)	**− 6	+ 1
Contractor Failures, Dun & Bradstreet				
Number	241(M)	629(3)	+30	+17
Liabilities, thous	$19,427(M)	42,190(3)	+68	+58

** Average per month

You can Harness the "CAN DO" of the amazing MASSEY-FERGUSON 204



for your own construction job!

FEATURING INSTANT REVERSE

The 204 stands tall and proud on an enviable record of "HAVE DONE." Here is a machine that's tough and powerful yet engineered for quick response and easy maneuverability.

Once you know the "well-oiled" almost effortless movement of Instant Reverse, you'll be saying "MUST HAVE"! This M-F torque converter system enables the 204 to move swiftly and easily between load and dump. Result — more efficiency — more work done with less operator exertion — for there is no shifting . . . no clutching . . . no levers to pull. Just a touch of the toe changes the direction of travel — one pedal to go forward; another to go reverse. And consider the much greater freedom afforded the operator to manipulate his loading or digging controls! Result — still more efficiency!

Contractors appreciate the agility and speed of the rugged 204 as it moves in close, operates in congested areas.

The marvelously versatile 204 above, and the many other Massey-Ferguson Industrial units, such as the M-F Fork Lift below can speed construction from cornerstone to rafter with their power-matched attachments — loaders, backhoes, blades, scrapers, material buckets, block tines, and others.

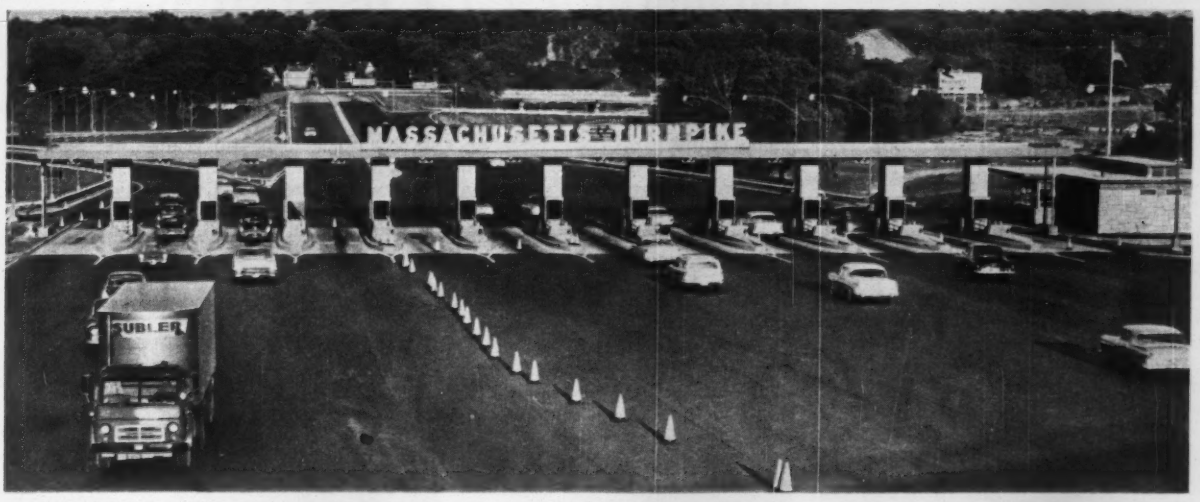
The Massey-Ferguson 204 Fork Lift has a big 5000-lb. capacity — is at home on paved or rough, soft unpaved areas — is equipped with Instant Reverse. The 20′ extension above is just one of a wide range of attachments to increase the 204's versatility.

Why Wait? — Set a Date — We'll Demonstrate!

MASSEY-FERGUSON INDUSTRIAL DIVISION
Block 1000 South West St., Wichita 13, Kansas
Producing Sizeable Power for the "Sensational 60's"

MF 60-38

Boston's $100-million Prudential Center, now under way, may be "married" to . . .



. . . A $200-million extension of the Massachusetts Turnpike, from terminus into Boston.

Projects' Fates Rest With Court

Two of the greatest construction projects ever undertaken in Boston are now tied together in a bill before the Massachusetts legislature. And it's a bill so new and different that the legislators, willing to pass it, will have to wait for the state supreme court to hand down an advisory opinion on it.

Project No. 1 is the $100-million Prudential Center—already started on a $5-million Back Bay site but waiting for state legislation to assure it an intended break on city real estate taxes (ENR Mar. 24, p. 316).

Project No. 2 is the $200-million Massachusetts Turnpike Extension—the long-sought 11-mile tollroad into and through Boston from the Turnpike's present terminus west of town.

"If you want to do something the hard way, come to Boston," said a spokesman for the Prudential Insurance Company of America last week.

But Boston officials and turnpike officials appear confident that the necessary legislation will pass if the supreme court rules favorably. The authority will be able to sell bonds—if the market will have them—by year-end, and Prudential Center's completion will be assured.

Here's how the proposed arrangement would work:

The Turnpike Authority would be permitted to acquire Prudential Center's 31-acre site either by eminent domain power or regular purchase. Prudential would then lease the site's air rights from the authority, with the authority turning the rent over to the city in lieu of taxes. The rental, of course, would be set to give Prudential about the same financial break it has been promised on taxes.

This legislation or some other statutory guarantee must go through. Pru-

dential has put Boston on notice that it will pull out in spite of its construction start—there'll be $6 million worth of foundations done by summer—unless the tax concession agreement is guaranteed by statute. The informal agreement that exists has already been threatened by a taxpayer suit.

Despite official optimism that the legislation will pass, there remains the big question of how or whether bonds will sell on the tollroad extension.

Investors may be wary of a new revenue issue backed primarily by tolls on a highway that will slash expensively across and along free city streets. Only high traffic volume or high tolls can make it work. (Chicago's $101-million Calumet Skyway, which may default on bond interest next year unless it gets a financial assist, is an example of how difficult this is.)

The proposed solution of Boston's problem is credited to E. J. McCormack, Jr., state attorney general. He got the idea from a court decision last year, which ruled that land and buildings of a state-owned pier at Gloucester, Mass., had to be taxed as a unit, not separately. From this he evolved the proposal that only the land-owner (the Turnpike Authority) would be taxed if the buildings-owner (Prudential) paid rent on air rights over the land.

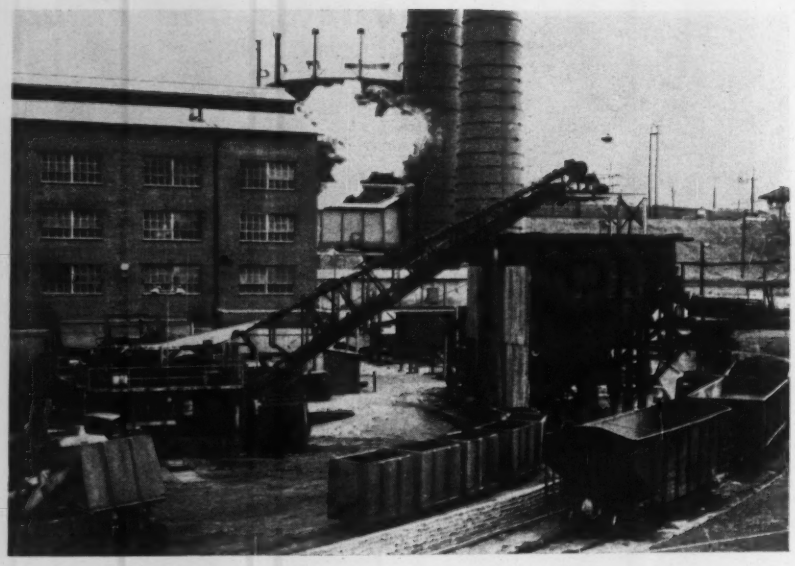
The actual rental agreement is this: On an 80-year lease, Prudential would make the first payment of $600,000 in 1961, with the rent increasing each year thereafter to a maximum of $2.5 million in 1967. From 1968 to 2040, payments would be $3 million annually. The insurance company would retain full income from its buildings throughout these periods. And after 2040, ownership of the buildings and land would revert to the City of Boston.

The Turnpike Authority, during the 80-year period of the lease, would own the Prudential Center land, and ownership of the land by the authority provides one of the key questions the court must decide: **Will failure of the Turnpike Authority to build the road prohibit the agency from owning land in no way connected with the turnpike?**

Under present plans, the extension would cross the tract, with an interchange serving the project. This apparently is the basis for the Turnpike Authority owning the tract.

According to terms of the proposed legislation, the authority would also build a 2,500 to 4,000 car parking garage on the tract.

So as it stands, the court must rule first, then the state must legislate, and finally bond buyers will decide the fate of two big projects, which have been tied into one complex financing bundle by optimistic Bostonians.



It may not be pretty, but . . .

Incinerator Pays Its Own Way

Atlanta officials are proud of one of the city's less attractive public installations—the refuse disposal plant. Residents are pleased, too—it doesn't add to their tax bill.

The $1.8-million unit earns enough each year to pay for its operation and help retire its bonds.

The city takes in $355,000 annually by selling byproducts of the incinerator—steam and tin cans.

The steam is sold to Georgia Power Co. Income was $150,000 in 1959.

Reclaimed tin cans are sold to Southern Ferro Alloy Division of Tennessee Products Corp., which also supplies some of the equipment needed. This rings up $205,000 annually.

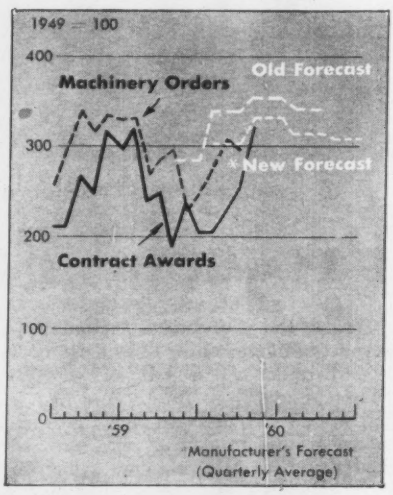
Machinery Orders Take a Dip

The Construction Machinery Orders Index for March dipped to 294, a decline of 13% from the March record set in 1959. The March value was also off from the February reading of 309. The index is based on average monthly volume in 1949 as 100.

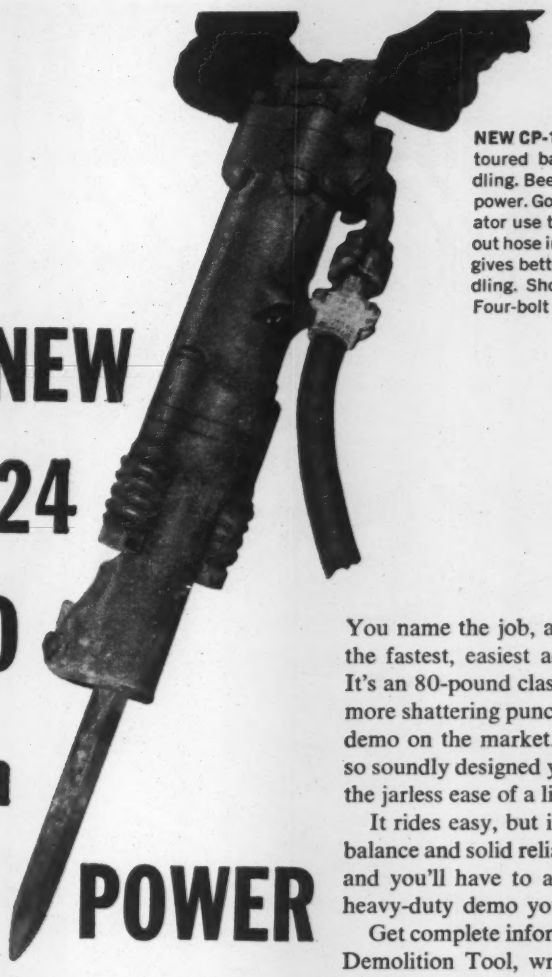
The index for the first quarter is only 1.3% short of last year's all-time high and 3.9% below the first quarter average of 305 forecast by manufacturers (ENR Apr. 14, p. 141).

The New Orders Index for Construction and Mining Machinery is computed by the McGraw-Hill Department of Economics from reports by cooperating equipment manufacturers.

Orders in the coming months, however, are in a position to spring sharply higher, because new orders closely follow the trend of contract awards. And last month, contractors' new business rolled up the second highest rate ever recorded by ENR. Heavy construction contract awards in April topped $2 billion, and averaged slightly more than $500 million per week (ENR May 5, p. 21).



The spurt pushed the April Contract Award Index to 320, based on 1949's weekly average as 100. April was second only to the peak set in December, 1950, which included $1 billion worth of federal atomic energy plants.



NEW CP-124 DEMO has body-contoured backhead for easier handling. Beefed up muscle for prying power. Gooseneck swivel lets operator use tool in any position without hose interference. Short length gives better balance...easier handling. Shock-proof steel retainer. Four-bolt backhead.

NEW CP-124 DEMO makes a POINT of POWER

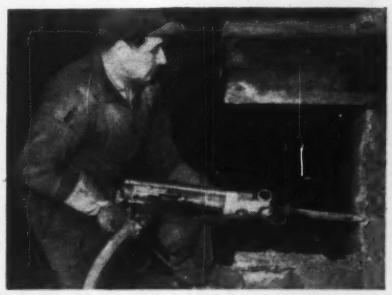
Specify a CP Demo Tool and you're ready to lick ANY JOB . . . ANY TIME . . . ANYWHERE

You name the job, and the "124" will give you the fastest, easiest action you've ever handled. It's an 80-pound class Demo, yes... but it packs more shattering punch per pound than any other demo on the market. It's so perfectly balanced, so soundly designed your men will handle it with the jarless ease of a lightweight tool.

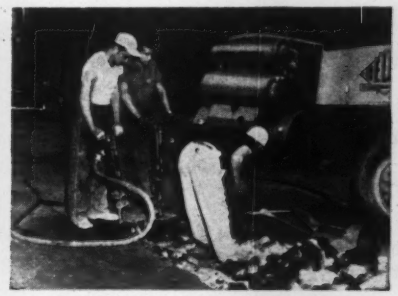
It rides easy, but it hits hard! Unmatched for balance and solid reliability. Try out the CP-124, and you'll have to agree with us: it's the best heavy-duty demo you can get.

Get complete information on the New CP-124 Demolition Tool, write to your CP equipment distributor. Ask for a copy of SP-3260. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

These Service-Proved CP Demos are an industry standard.



CP-115 makes horizontal breaking easy.



CP-117 puts profit in paving breaking.

Lightweight CP-113 hits hard, handles safely.

Chicago Pneumatic *8 East 44th Street, New York 17, N. Y.*

AIR COMPRESSORS • PNEUMATIC AND ELECTRIC TOOLS • AIR-BLAST BITS • REICHdrills • ROCK DRILLS

ASPHALT

PROVIDES THREE WAY BENEFITS: Taxpayers, contractors, and motorists – all benefit in three important ways by paving their local roads with Asphalt.

LOWER COSTS FOR THE TAXPAYER. Asphalt can save 10% to 50% in initial construction costs.

EASE OF CONSTRUCTION. Asphalt roads paved in ribbons are completed faster. No expansion joints, forms or curing time required. Contractors can meet faster schedules, obtain contract payments more quickly.

SMOOTHER RIDE FOR THE MOTORIST. Continuous, flexible asphalt paving gives the smoothest ride. Reduces tire hum and vibration to a minimum. For more information, call or write: Esso Standard, Division of Humble Oil & Refining Company, 15 West 51st Street, New York 19, N. Y.

Esso

ASPHALT PRODUCTS

In Industry after Industry..."ESSO RESEARCH works wonders with oil"

Wages Are Still Going Up—No Slowdown

Current wage increases for some of the nation's union construction workers are running considerably above last year's average.

Increases totaling 60 cents an hour over the next three years, for example, have been won by cement masons in the Seattle, Wash., area. And some 25,000 construction laborers in southern California have done almost as well by settling for 38 cents in a two-year contract. The 1960 increase for the cement masons is 25 cents. It's 20 cents for the laborers.

These compare with an average 1959 increase of 15.6 cents, as computed by the U.S. Labor Department. (That figure includes deferred wage increases. ENR reported a 1959 average of 13.8 cents, and the Bureau of National Affairs came up with an average of 14.3 cents, both exclusive of deferred increases.)

The cement masons settlement ended a month-long strike against members of the Seattle and Mountain-Pacific chapters of Associated General Contractors. Deferred increases under the new contract are 18 cents next year and 17 cents in 1962. Scale before the strike was $3.42.

Increases for the laborers were negotiated under a wage reopener in the current long-term contract with four contractor groups. The 1960 increase, effective June 15, will push the laborers' scale to $3.08. Next year's deferred pay raise will be 18 cents and is due May 1.

Increases closer to the pattern established last year have been accepted by plasterers in Denver, Colo., and by laborers in Pittsfield, Mass.

The plasterers will get 27½ cents over the next two years—12½ cents retroactive to March 31, another 5 cents October 7 and 10 cents more next April 1. New scale is $3.70.

The new two-year contract for the Pittsfield laborers call for a 30-cent increase payable in three installments—15 cents now, 5 cents in November and 10 cents next May.

More modest increases of 10 cents a year for the first two years of a three-year contract have been negotiated by the iron workers and four steel fabricating firms in the Hartford, Conn., area. The third year raise is not predetermined and is subject to a reopener clause.

Labor in Brief . . .

• **Asks for more curbs**—A labor negotiator for Bethlehem Steel Co. says the constant rise in costs and subsequent inflationary pressures cannot be curtailed until the "vast" political and economic power of unions is curbed. He has advocated political action by businessmen at all levels to break labor's power.

• **A secondary boycott?**—The National Labor Relations Board has asked a federal court to enjoin a plumbers local union in Marietta, Ohio, from refusing to handle prefabricated pipe manufactured by an Ohio and West Virginia firm. It charges that the union is trying to induce a strike to force a plumbing contractor to quit doing business with the two firms.

• **Right-to-work**—Gov. Joe Hickey of Wyoming says he would personally oppose a right-to-work law banning the union shop in Wyoming. He claims it is basically a problem for the legislature to decide but feels such a law "would not benefit the majority of the people."

• **Forced merger**—AFL-CIO President George Meany has broken a stalemate in achieving labor unity in New Jersey by lifting the charters of the AFL and CIO state organizations. A merger convention will be held on May 19 and 20.

• **Higher benefits**—Maximum unemployment benefits in Vermont will be increased from $36 to $48 a week July 1 under a 1959 law that gears benefits to weekly wages. Vermont is one of the six states with such a law. Maximum benefits are 50% of average weekly wages.

• **Bigger taxes**—Legislators in Alaska have passed a bill levying jobless benefit taxes on all wages paid up to $7,300 a year—$3,000 more than was covered before. After October 1, employers will be subject to new variable rates ranging from 1.5% to 4%.

• **Civil rights**—AFL-CIO President George Meany says the civil rights action of Congress failed to fulfill the federation's hopes for a "truly meaningful bill." He criticized omission of the school provision and rejection of a provision to create a permanent commission to eliminate racial discrimination on federal contract work.

• **Can't promise**—A promise by a union representative that workers will not lose their jobs if they strike does not hold water because the jobs are not his to promise. So ruled a Tennessee court in dismissing a $2-million damage suit against a union by workers who struck and lost their jobs.

Independent Contractors Test Industry Promotion

A federal court has been asked to rule that an industry promotion program financed by employer contributions called for by a labor contract is illegal under the Taft-Hartley Act.

The suit was filed by a group of eight independent plastering contractors in southern California. It is directed against efforts of the Contracting Plasterers Association of Southern California and area locals of the plasterers union to promote use of lath and plaster.

The contractors claim that the law authorizes certain types of employer contributions, such as those for pensions and health and welfare, but does not mention industry promotion programs.

An employer contribution of 4¾ cents an hour per employee is paid by members of CPA to finance the program.

The lawsuit is part of a dispute between independent contractors, on the one hand, and CPA and the local unions on the other. Several independent contractors are claiming in other legal actions that the master labor agreement between CPA and the local unions violates the anti-trust laws.

It is claimed that the unions and organized contractors can control the industry by using the agreement to deny workers to contractors who refuse to meet the terms of the contract.

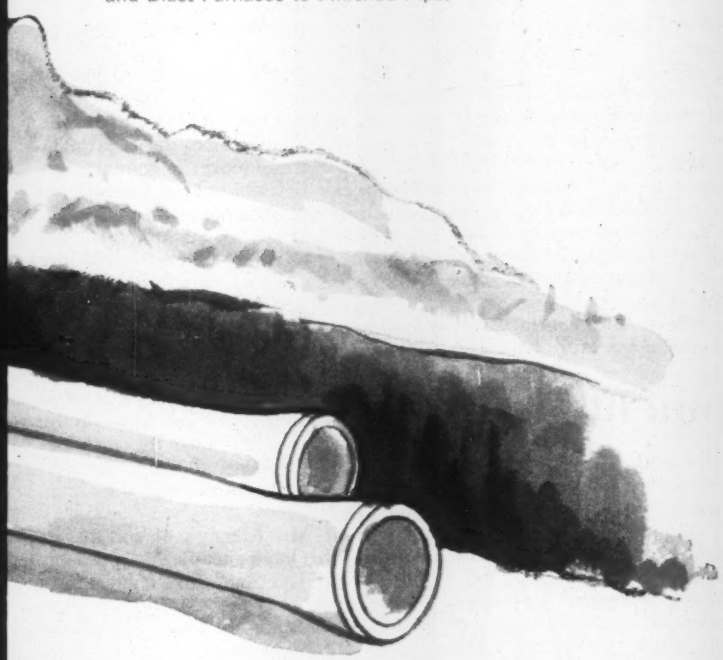
U.S. cast iron PIPE FOR WATER, SEWERAGE AND

saving's in style again!

Today . . . figuring costs . . . you need a sharper-than-ever pencil. And the closer and sharper you figure, the more you need Tyton.®
The facts: Tyton Joint® pipe is easy to assemble . . . can be laid faster even by green crews.
Tyton cuts overhead, bookkeeping, storage costs—only one accessory needed. It increases working days . . . can even be laid in rain or wet trench.
Simple, speedy, sure, Tyton Joint pipe is tailormade to meet today's rising costs. Judge for yourself.
For the full story, write or call.

U.S. PIPE AND FOUNDRY COMPANY
General Office: Birmingham 2, Alabama

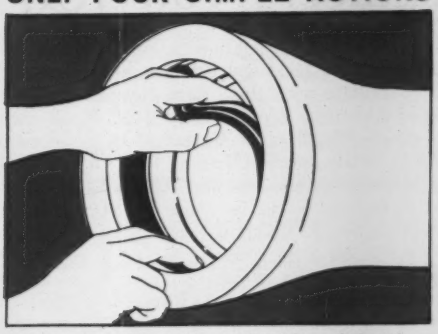
A Wholly Integrated Producer from Mines and Blast Furnaces to Finished Pipe.



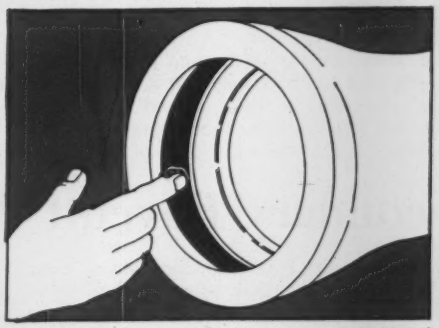
INDUSTRIAL SERVICE CAST IRON®

TYTON®

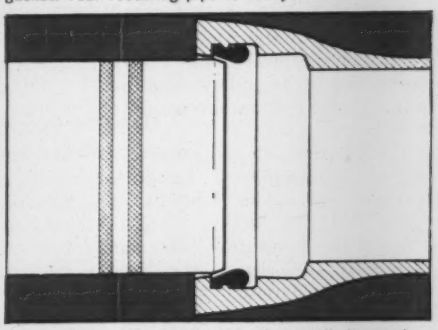
ONLY FOUR SIMPLE ACTIONS



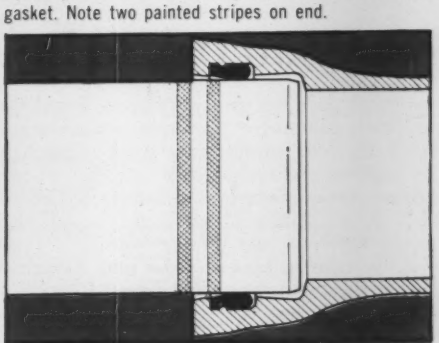
Insert gasket with groove over bead in gasket seat . . . a simple hand operation.



Wipe film of Tyton Joint® lubricant over inside of gasket. Your receiving pipe is ready.



Insert plain end of entering pipe until it touches gasket. Note two painted stripes on end.



Push entering pipe until the first painted stripe disappears and the second stripe is approximately flush with bell face. The joint is sealed . . . bottle-tight, permanently! The job's done . . . . fast, efficiently, economically. Could anything be simpler?

Engineers Vote IUE Tie-Up

The Engineers Association, a union of engineers and technical workers, has voted to affiliate with the International Union of Electrical Workers, AFL-CIO. But extended legal proceedings are expected to delay actual affiliation.

EA, which is certified by the National Labor Relations Board, is made up of engineers and technicians at Sperry Gyroscope Co., Long Island, N. Y., a division of Sperry Rand Corp.

Members of EA voted 435 to 258 last week for affiliation with IUE (ENR Apr. 7, p. 103). A second ballot is required by the union's constitution for decisions of this magnitude, but a similar vote is expected.

The delay in carrying through affiliation will result from a clause that is part of the four-year contract signed by Sperry and EA in 1958. According to this clause, no EA affiliation with an organization of production and maintenance workers shall become effective until it receives majority approval from all members of the bargaining unit in an election conducted by the American Arbitration Association.

The bargaining unit is made up of some 3,200 Sperry professional and technical employees eligible to join EA. Only about 800 are members.

Sperry attorneys went to the New York State Supreme Court for a temporary restraining order and an injunction that will delay the affiliation until either the proposal is submitted to a vote under the terms of the contract or a court decides that EA need not comply with the clause.

EA lawyers successfully filed for a removal of the case to U. S. District Court, New York Southern District. Hearings will be held soon.

Secondary Boycott Rejected

In handling its first secondary boycott case under the new rules of the Landrum-Griffin reform law, the National Labor Relations Board found a hod carriers' local guilty of illegal pressure on a general contractor who dealt with a nonunion contractor.

The new law specifically bans a union from pressuring a secondary employer to help it organize a nonunion employer on the same project.

The Taft-Hartley act permitted such pressure on an employer. Landrum-Griffin does not. The labor-backed Thompson bill now before Congress would repeal the Landrum-Griffin ban. It is currently tied up in the Rules Committee of the House.

The board unanimously found Omaha, Neb., Local 1140 of the Hod Carriers Union guilty of an unfair labor practice. The local threatened to picket the Gilmore Construction Co. of Omaha, the general contractor, unless it ceased doing business with the Simpson Co., an acoustical contractor, the only nonunion contractor on a high school construction project.

When Gilmore declined, the hod carriers picketed the project, closing it down. Gilmore appealed to the NLRB, and the ruling followed.

In pressing for the Thompson bill in Congress, AFL-CIO building trades officials are seeking the right to picket construction projects against nonunion contractors by lifting the secondary boycott ban. This would, in effect, make all common site contractors a single contractor in the eyes of the law.

Most Road Pay to Equipment Men

Equipment operators and workers associated with equipment operation get the lion's share of employment generated by highway and bridge work.

A recent survey made by the Bureau of Public Roads indicates that each $1 billion of highway and bridge work under active construction provides jobs for 48,000 men with a weekly payroll of $4.6 million.

Two allied groups account for 43% of the hours worked and 47% of the wages paid. These are equipment operators (such as truck drivers and operators of bulldozers, scrapers, graders, cranes, rollers, pavers and pile drivers) and those who work with them (oilers, mechanics, firemen, stationary engineers, pile drivermen).

Unskilled occupations account for 33% of the hours worked and 25% of the wages paid.

Truck drivers represent the largest single occupational group in terms of hours of work and wages received. Carpenters are second.

Miscellaneous crafts, such as concrete finishers, structural steel and reinforcing steel workers, painters, electricians and plumbers, get only 7% of the work generated and 10% of the wages paid, according to the survey.

Breakthrough on Bias

GSA puts pressure on firm to hire Negro electricians

The General Services Administration is turning the pressure on the prime contractor for a federal building project in Washington to get his electrical subcontractor to hire Negro electricians, following a first success in hiring Negroes to install reinforcing steel.

GSA Administrator Franklin Floete last week called in Matthew McCloskey, head of McCloskey & Co., a Philadelphia construction firm, to discuss the matter. Mr. McCloskey is the prime contractor for construction of the new Federal Office Building No. 6.

The day after the meeting, AFL-CIO President George Meany told a news conference that he hoped for a speedy breakthrough in solving the knotty problem.

However, GSA officials say that no substantial progress was made in breaking the deadlock at the meeting with Mr. McCloskey.

Mr. McCloskey agreed only to review the applications of four or five prospective Negro electricians in order to determine whether they meet qualifications for work on the job. He agreed to report his views to GSA, but set no time limit for doing so, according to GSA officials.

The applications were originally screened by the Washington Urban League which, in alliance with the President's Committee on Contracts, has been a prime mover in trying to get Negro electricians hired on federal construction jobs in the capital.

The electrical subcontractor, the Howard P. Foley Co., says it would hire the Negroes but has not found any yet who could satisfy the necessary qualifications.

Officials on the President's Contracts Committee, headed by Vice President Nixon, say they are optimistic that Negroes eventually will get taken on the job. They say they have the promises of Mr. McCloskey and Mr. Foley that Negroes will get taken on if they qualify.

Part of Mr. Meany's optimism, according to labor people, is probably due to the fact that two Negroes have been hired by the McCloskey firm through Washington Local 201 of the AFL-CIO Ironworkers Union for work on the federal office building.

The two Negroes have been working for more than two weeks and there has been no report of trouble on the project. There had been fears that white workers might balk at working beside Negroes.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: June 2, 1960.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., advanced standard time, which is nine-thirty o'clock A. M., eastern standard time, on the 2nd day of JUNE 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1; G. L. NICKERSON; District Engineer, 353 Broadway, Albany 1, New York						
Albany (Rte. 5)	R.C. 60-65	Albany-Schenectady, Pt. 1, S.H. 176 Albany-Schenectady, Pt. 2, S.H. 385	6.86	Asph. Conc.=3.00 Mi. Subsealing Exist. Pavt.=3.86 Mi.	$12,000 Plans $5	$217,000
DISTRICT No. 3, E. E. TOWLSON, District Engineer, 333 E. Washington Street, Syracuse, New York						
Onondaga (Rte. 5)	R.C. 60-51	Elbridge-Camillus, Pt. 2, S.H. 5143	4.00	Asph. Conc. Type 1A	$13,000 Plans $5	230,000
Tompkins (Rte. 34)	R.C. 60-78	Ithaca-West Danby, Pt. 1, S.H. 5379 Ithaca-West Danby, Pt. 2, S. H. 5567 Spencer-West Danby, Pts. 1 & 2, S.H. 8155	8.69	Asph. Conc. Type 1A	$25,000 Plans $5	438,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Livingston (Rte. 408)	FARC 60-63	Portage-Mt. Morris, Pt. 2, S.H. 5271 Portage-Mt. Morris, Pt. 3, S.H. 5270 Project F-557(10)	9.59	Asph. Conc.=9.53 Mi. Misc. Work=0.06 Mi.	$36,000 Plans $5	642,000
Monroe (Rte. 252)	FARC 60-60	Ballantyne Bridge-Pittsford Pt. 1, S.H. 8443 Ballantyne Bridge-Pittsford Pt. 2B, S.H. 8423 Project F-600(8)	5.95	Asph. Conc.=5.93 Mi. Misc. Work=0.02 Mi.	$22,000 Plans $5	393,000
Monroe (Rte. 261)	FARC 60-57	West Greece-Manitou Beach, S.H. 1281 Project F-508(9); S-584(1)	5.81	Asph. Conc.=5.77 Mi. Misc. Work=0.04 Mi.	$20,000 Plans $5	352,000
Wyoming (Rte. 39)	R.C. 60-68	Castile Village, S.H. 1088; Castile-Castile Center, S.H. 892; Castile Center-Perry Center, S.H. 854	6.20	Asphalt Concrete	$19,000 Plans $5	339,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Cattaraugus (Rte. 17)	R.C. 60-76	Vandalia-Carrollton, S.H. 5430	2.12	Asph. Conc.=2.08 Mi. Misc. Work=0.04 Mi.	$16,000 Plans $5	298,000
Niagara (Rte. 31)	FARC 60-72	Sanborn-Pekin, S.H. 740; Sanborn-Lockport, S.H. 9094; Shawnee-Cambria, S.H. 729 Project F-709(8)	5.49	Asph. Conc.=5.46 Mi. Misc. Work=0.03 Mi.	$35,000 Plans $5	634,000
Niagara (Rte. 31)	FARC 60-77	Wendts Corners-Gasport, S.H. 8451 Project S-672(2)	3.00	Asphalt Concrete	$26,000 Plans $5	464,000
DISTRICT No. 6, WM. J. DENNIS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Steuben (Rte. 53)	R.C. 60-82	Prattsburg-Naples, Pt. 1, S.H. 8296 Prattsburg-Naples, Pt. 2, S.H. 8326	5.87	Asphalt Concrete	$25,000 Plans $5	438,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
St. Lawrence (Rte. 56)	R.C. 60-81	Potsdam-Norwood, S.H. 1032	5.37	Asphalt Concrete, Type 1A	$10,000 Plans $5	188,000
Clinton	FASSRC 60-5	Ellenburg-Irona, C.R. 55 (FAS-SS 40-11) Project S-167(4)	6.41	Asph. Conc. Type 1A	$10,000 Plans $5	183,000
Jefferson (Rte. 11)	FARC 60-64	Watertown-Philadelphia, Pt. 1, S.H. 5651 Project F-206(7)	1.35	Asph. Conc. Type 1A	$3,000 Plans $5	55,000
Lewis	FASSRC 60-6	Indian River-Remington Corners, CR 11 (FASS 51-4) Project S-337(3)	10.67	Asph. Conc. Type 1A	$19,000 Plans $5	319,000
DISTRICT No. 9, J. C. FEDERICK, District Engineer, 71 Frederick Street, Binghamton, New York						
Sullivan (Rte. 52)	R.C. 60-79	Stone Bridge-Falls Mills, S.H. 824 Jeffersonville-Homona Lake-Fosterdale, S.H. 795	5.78	Asphalt Concrete	$12,000 Plans $5	221,000
Broome (Rte. 79)	R.C. 60-71	Harpursville-Onaquaga, S.H. 1106 Harpursville, S.H. 210; Center Village, S.H. 211	4.79	Asphalt Concrete	$10,000 Plans $5	183,000
Chenango (Rte. 41)	R.C. 60-74	Cincinnatus Lake-Long Pond, S.H. 8071 Long Pond-Smithville Flats, S.H. 5260	4.01	Asphalt Concrete	$10,000 Plans $5	181,000
Delaware (Rte. 8)	R.C. 60-61	Deposit-Masonville, S.H. 1888	5.06	Asphalt Concrete	$12,000 Plans $5	213,000
Delaware (Rte. 10)	R.C. 60-75	Bloomville-Hobart, Pt. 2, S.H. 8118	6.60	Asphalt Concrete	$15,000 Plans $5	279,000
Delaware (Rte. 10)	R.C. 60-73	Rockrift-Colchester, S.H. 1271	6.46	Asphalt Concrete	$14,000 Plans $5	247,000
Otsego (Rte. 205)	R.C. 60-69	West Oneonta-Hartwick, Pt. 2, S.H. 8387	5.84	Asphalt Concrete	$13,000 Plans $5	230,000
Schoharie (Rte. 30)	R.C. 60-67	Grand Gorge-Breakabeen, Pt. 2, S.H. 8312 Grand-Gorge-Breakabeen, Pt. 3, S.H. 8270	4.57	Asphalt Concrete	$10,000 Plans $5	176,000
Schoharie (Rte. 30)	R.C. 60-80	Grand Gorge-Breakabeen, Pt. 3, S.H. 8270 Grand Gorge-Breakabeen, Pt. 4, S.H. 8070	4.57	Asphalt Concrete	$10,000 Plans $5	178,000
Sullivan (Rte. 17B)	R.C. 60-70	Falls Mills-Callicoon, S.H. 823	4.80	Asphalt Concrete	$10,000 Plans $5	184,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN

SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Prequalification: July 15, 1960

Hydroelectric Project Corporacion Autonoma Regional Del Cauca Cali, Colombia

Prequalification July 15, 1960
Prequalification Questionnaire

NOTICE TO CONTRACTORS

It is expected that during the second half of 1960 the Corporacion will request bids from a selected list of prequalified contractors for the construction of the Calima Hydroelectric Project, near Cali. The project will include a rockfill dam with a maximum height of about 100 meters and a volume of about 2,000,000 cubic meters; an 120,000 kw underground powerhouse with a vertical access shaft about 230 meters deep and an inclined access tunnel about 700 meters long; a morning glory spillway; a power intake and gate shaft; a power tunnel and inclined penstock shaft; a tailrace tunnel about 1630 meters long; a diversion tunnel 660 meters long; a tributary diversion tunnel 7 kilometers long; and appurtenant works.

Interested firms that have satisfactorily performed comparable work should apply promptly for prequalification forms to the Corporacion, Apartado Aereo 2366, Cali, Colombia. Completed prequalification forms will be required no later than July 15, 1960. Bids will be received from prequalified bidders only.

Bids: June 6, 1960

Construction of Lake Street Bridge

ADVERTISEMENT FOR BIDS
CITY OF ELMIRA
CHEMUNG COUNTY, NEW YORK

Sealed proposals will be received by the City Manager in his office, City Hall, Elmira, New York, until 7:30 P.M. Eastern Daylight Saving Time on Monday, June 6, 1960, at which time and place said proposals will be opened and read aloud at a regular meeting of the Council of the City of Elmira, for the construction of the Lake Street Bridge, as follows:

CONTRACT NO. 1—DEMOLITION OF EXISTING BRIDGE: This Contract provide for the demolition of the existing Lake Street Bridge over the Chemung River, including the piers, but not including the abutments. This bridge is a three-span simple truss structure on masonry piers and abutments.

CONTRACT NO. 2—CONSTRUCTION OF NEW BRIDGE: This Contract provides for the construction of the new Lake Street Bridge, to be located on the site of existing bridge. The new Lake Street Bridge will be a seven-span composite stringer structure on reinforced concrete piers and abutments.

COMBINED CONTRACT NO. 1-2—DEMOLITION OF EXISTING BRIDGE AND CONSTRUCTION OF NEW BRIDGE: This Contract provides for all work included under Contract No. 1 and Contract No. 2.

BIDDERS WHO SUBMIT A BID FOR COMBINED CONTRACT NO. 1-2 MUST ALSO SUBMIT SEPARATE BIDS FOR BOTH CONTRACT NO. 1 AND CONTRACT NO. 2 BIDDERS WHO DO NOT SUBMIT A BID FOR COMBINED CONTRACT NO. 1-2 MAY SUBMIT A BID FOR CONTRACT NO. 1 AND/OR FOR CONTRACT NO. 2.

Drawings, Specifications, Instructions to Bidders, Proposals and forms of Proposal Bond, Contract and Performance Bond may be examined at the office of the City Manager, City Hall, Elmira, and at the office of Parsons, Brinckerhoff, Quade & Douglas, Engineers, 165 Broadway, New York 6, N. Y. Copies may be obtained at the office of the City Manager upon deposit of twenty-five dollars, and also at the office of Parsons, Brinckerhoff, Quade & Douglas, 165 Broadway, New York 6, N. Y. upon like terms and conditions.

The $25.00 deposit will be refunded upon return, by the Bidder, of the Drawings and Specifications in good condition. If a bid is not submitted only $10.00 of the deposit will be refunded if Drawings and Specifications are returned in good condition.

Each Proposal must be submitted on the Forms furnished by the City and shall be accompanied by a Bid Security in the form of an acceptable Proposal Bond or a certified check in an amount not less than five percent (5%) of the total bid, payable at sight to the City of Elmira, except that certified checks will not be required for Contract No. 1 and Contract No. 2 from Bidders who bid on Combined Contract No. 1-2. Said deposits will be held by the City subject to the requirements set forth in the Information for Bidders.

Each successful Bidder will be required to furnish a satisfactory Performance Bond in the amount of One Hundred Percent (100%) of the accepted Bid.

Contract No. 1 and Contract No. 2 may each be separately awarded, at the option of the City of Elmira to the lowest responsible bidder, as the public interest shall dictate.

Combined Contract No. 1-2 may be awarded after consideration of the separate bids on the separate Contracts Nos. 1 and 2, to the lowest responsible bidder.

The City reserves the right to make awards to the lowest responsible bidders under each of the two separate Contracts or to award the Contract to the lowest responsible bidder on the Combined Contract, as the public interest shall dictate.

The City of Elmira reserves the right to reject any or all bids and to waive any informalities therein.

City of Elmira
By: William C. Branagan
City Manager

Dated May 12, 1960

Bids: See Advertisement

Contract EP-110.003 and Contract PN-140.031

THE PORT OF NEW YORK AUTHORITY

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on date indicated, at which time said proposals will be opened and read in Room 1108.

Contract EP-110.003—Elizabeth-Port Authority Piers—Berths 52, 54, 56 and 58—Wharf Construction—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Tuesday, June 7, 1960.

Contract PN-140.031—Port Newark—Paved Area at Distribution Street and Doremus Avenue—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Tuesday, May 31, 1960.

Contract documents may be seen at the office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, N. Y. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each set equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, May 12, 1960

Bids: June 2, 1960

Demolition of Massena Canal (Alcoa) Power Plant Superstructures and Removal of Canal Bridge Near Massena, St. Lawrence County, New York

POWER AUTHORITY OF THE STATE OF NEW YORK

ADVERTISEMENT FOR PROPOSALS
SPECIFICATION NO. PA-5-11056
ST. LAWRENCE CONTRACT NO. 60

NOTICE TO CONTRACTORS: The Power Authority of the State of New York will receive sealed proposals for Demolition of Massena Canal (Alcoa) Power Plant Superstructures and Removal of Canal Bridge, near Massena, St. Lawrence County, New York, until 10:30 A.M. Eastern Daylight Saving Time, on the 2nd day of June, 1960, at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are:

Schedule No. 1:
Demolition of power plant superstructures of steel and masonry construction, having a total enclosed area of approximately 38,000 square feet. Construction of approximately 600 linear feet of chain link fencing.

Schedule No. 2:
Dismantling and removal of a highway bridge having a truss main span of 408 feet and a plate girder approach span of 63 feet.

All work included in Schedule No. 1 and Schedule No. 2 shall be completed on or before November 30, 1960.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, at the 18th Floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents and Five Dollars ($5.00) per set for additional sets no part of which will be refunded. Plans, Specifications and Projosal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the maximum price bid for any bid schedule.

The right is reserved to make award on any one or more of the above schedules, separately or in combination, as fully described in the Proposal, and to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-5-11056

Bids: June 15, 1960

Narrows Bridge—Contract NB-4

TRIBOROUGH BRIDGE AND TUNNEL AUTHORITY

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. Wednesday, June 15, 1960

For Narrows Bridge Contract No. NB-4, Furnishing and Delivering Metalwork for Cable Anchorages. The work includes cable anchor bars, structural framing and cable saddle castings. The bid must be accompanied by a deposit in the amount of $150,000.

Plans, specifications and contract documents may be purchased at the office of the Authority for $20.00, which will not be refunded.

District of Columbia, Building Construction—Dept. of Bldgs. & Grounds, April 29, 1960. CONSTRUCTION OF ADDITION TO RUDOLPH ELEMENTARY SCHOOL, Ingraham and 2nd Sts., N.W., Wash., D. C. (Invitation No. C-60162-B). Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Rm. 404, 499 Pa. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer. (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EDT, May 27, 1960, in Rm. 424, 499 Pa. Ave., N.W.

Contractors Watch This Section—

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

OFFICIAL PROPOSALS

Bids: May 19, 1960

Soil Explorations and Foundation Investigations Grand Central Parkway, L. I., N. Y.

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Advanced Eastern Standard Time on May 19, 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON GRAND CENTRAL PARKWAY RECONSTRUCTION, SECTION 1, BROOKLYN-QUEENS EXPRESSWAY TO NORTHERN BOULEVARD, QUEENS COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. SM-161.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) Mr. Austin M. Sarr, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, Long Island, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.
The Engineer's Estimate of cost for this work is $32,875.00.
Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $2,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".
The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF
PUBLIC WORKS

Bids: May 23, 1960

Two Hangar Buildings at Detroit Metropolitan Wayne County Airport

INVITATION FOR BIDS

Detroit, Michigan

Sealed proposals will be received by the undersigned in Room 726 on the 7th Floor, City-County Building, Woodward and Jefferson Avenue, Detroit 26, Michigan, until 2 P.M. Eastern Standard Time, Monday, May 23, 1960, at which time and place all bids will be publicly opened and read for the furnishing and erecting of structural steel, metal siding, metal roof deck, insulation, built-up roofing and hangar doors for the two (2) hangar buildings to be located at Detroit Metropolitan Wayne County Airport, Romulus Township, Wayne County, Michigan, for the Board of Wayne County Road Commissioners. The trade elements listed above will be included under one contract.
Plans, specifications and proposal blanks may be secured by prospective bidders, on or after 1 P.M., Monday, May 2, 1960, upon application in Room 726 on the 7th Floor, City-County Building, Woodward and Jefferson Avenue, Detroit, Michigan.
Each sealed bid shall be accompanied by a cashier's check or certified check in a sum which is not less than five per cent (5%) of the total amount of the bid (to the nearest multiple of $100.00) payable to the Board of County Road Commissioners of the County of Wayne, Michigan.
Proposals which have been submitted shall not be withdrawn after the time set for the opening of bids.
The Board reserves the right to reject any or all bids and to waive any informalities in bids.

BOARD OF COUNTY ROAD COMMISSIONERS OF THE COUNTY OF WAYNE, MICHIGAN
Charles L. Wilson, Chairman
Michael J. O'Brien, Vice-Chairman
William E. Kreger, Commissioner

Bids: May 24, 1960

Pumping Stations

NOTICE TO BIDDERS

FAIRFAX COUNTY WATER AUTHORITY
ANNANDALE, VIRGINIA
PROJECT 15

Sealed proposals will be received by the Fairfax County Water Authority at the office of the Authority, 7310 Maple Street, Annandale, Virginia, or by mail addressed to the Authority, P. O. Box 91, Annandale, Virginia, until 2:00 P.M., EASTERN DAYLIGHT TIME, MAY 24, 1960, at which time they will be read aloud, and contracts awarded as soon thereafter as practicable for the construction of pumping stations at various locations in Fairfax County, Virginia.
The work comprises the furnishing of all materials and construction of the pumping stations and appurtenant work and is divided into two divisions, as follows:
Division A—Langley Pumping Station, comprising two pumping units each at 3.5 MGD at 150 ft. total dynamic head and two pumping units each at 7.0 MGD at 235 ft. total dynamic head.
Division B—Fairfax Circle Pumping Station, comprising two pumping units each at 1200 GPM at 100 ft. total dynamic head.
Bidders may submit proposals on either Division or on both Divisions.
The Instruction to Bidders, Proposal, Agreement, Form of Bid Bond, Performance Bond, Plans and Specifications for the work may be examined at the office of the Fairfax County Water Authority, 7310 Maple Street, Annandale, Virginia, and at the office of Greeley and Hansen, Engineers, 14 East Jackson Boulevard, Chicago 4, Illinois. Copies of the Plans and Contract Documents may be obtained upon the deposit of $50.00 for each set, to be refunded upon return of such set in good condition within 10 days after the opening of bids.
Each proposal must be accompanied by a bid bond or a certified check on a solvent bank or trust company, made payable to the Fairfax County Water Authority, in the amount of 5% of the total amount bid for each Division for which a proposal is submitted, as assurance that the bid is made in good faith.
Bidders must be registered as Contractors in the Commonwealth of Virginia, as provided by Chapter 7 of Title 54 of the Code of Virginia of 1950.
The Fairfax County Water Authority reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to the interests of the Authority after all bids have been examined and canvassed.

FAIRFAX COUNTY WATER AUTHORITY
By: James J. Corbalis, Jr.
Engineer-Director

April 25, 1960

Bids: May 26, 1960

Soil Explorations and Foundation Investigations on Interstate Route 505

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Advanced Eastern Standard Time, on May 26, 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:
SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 505, SECTIONS 3, 4 and 5 BROAD AVENUE TO HINMANS CORNERS, NEW PROJECT NUMBER 1-81-1(11)0, ITEM 13B, BROOME COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-159.
Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) Mr. Joseph C. Federick, District Engineer, New York State Department of Public Works, 71 Frederick Street, Binghamton, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.
The Engineer's Estimate of cost for this work is $38,850.00.
Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $2,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."
The right is reserved to reject and or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF PUBLIC WORKS

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5332) will be received at Albuquerque, New Mexico, until 10 a.m., Mountain Standard Time, June 14, 1960, for furnishing labor and materials for earthwork, clearing, and structures for irrigation rehabilitation, Belen Unit 8, Middle Rio Grande Project, New Mexico. Location near Belen, New Mexico. Principal items are lump sum—clearing about 8.2 miles of waterway; 19,500 cu. yds. excavation from borrow; 45 turnouts, constructing farm turnouts; 1,342 lin. ft. concrete and corrugated-metal pipe; 221 cu. yds. concrete in structures; and other work. Completion date is March 15, 1961. For particulars, address Bureau of Reclamation, P. O. Box 252, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5330) will be received at Prineville, Oregon, until 10 a.m., Pacific Standard Time, June 9, 1960, for furnishing labor and materials for Ochoco Relift and Barnes Butte Pumping Plants and discharge lines, Crooked River Project, Oregon. Location near Prineville, Oregon. Principal items are 20,530 cu. yds. excavation; 3,580 lin. ft. furnishing and laying 42- and 54-inch precast concrete pipe; 620 cu. yds. concrete; lump sum—furnishing and installing steel intake and discharge manifolds; and other work. Completion time 430 days. For particulars, address Bureau of Reclamation, P. O. Box 937, Boise, Idaho; P. O. Box 477, Prineville, Oregon; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5328) will be received at Prineville, Oregon, until 10 a.m., Pacific Standard Time, June 8, 1960, for furnishing labor and materials for earthwork and structures, Diversion Canal and Headworks, Crooked River Project, Oregon. Location near Prineville, Oregon. Principal items are 372,000 cu. yds. excavation; 52,000 cu. yds. compacting embankments; 10,340 cu. yds. blended earth and sand and gravel linings for canal; 2,357 cu. yds. concrete in structures; and other work. Completion time 390 days. For particulars, address Bureau of Reclamation, P. O. Box 477, Prineville, Oregon; or Building 53, Denver Federal Center, Denver, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-5334) will be received at Denver, Colorado until 2 p.m., Mountain Standard Time, June 9, 1960, for furnishing penstocks and accessories (estimated weight 8,250 pounds) for Clear Creek and Trinity Powerplants, Central Valley Project, California. Delivery is desired within 480 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado. Floyd E. Dominy, Commissioner.

OFFICIAL PROPOSAL

RATE $2.40 per line (or fraction) per insertion.
CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.
SEND COPY: Official Proposal Division, Class. Adv. Div.; Engineering News-Record, P. O. Box 12, New York 36, N. Y.

ENGINEER-DESIGNER

Minimum 10 years of experience in the design of hydro structures in U. S., some planning experience desirable. Send complete resume of experience and qualifications to the

HARZA ENGINEERING COMPANY
400 W. Madison St. Chicago 6, Ill.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv.-Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

EMPLOYMENT OPPORTUNITIES

NATIONAL COVERAGE

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

MAY 26TH ISSUE CLOSES MAY 16TH

UNDISPLAYED RATE:

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

• POSITIONS VACANT

Civil Engineer for staff consulting work. Must have broad background in highway construction, knowing control of soils, design and control of concrete and bituminous mixes, plus actual field construction supervision. Minimum age—35 years. Salary, $9,000 to $12,500. Only complete application will be reviewed. P-4257, Engineering News-Record.

Civil Engineer with municipal experience. Able to register as a Civil Engineer in State of Ohio. Send complete resume of experience and qualifications to P-4320, Engineering News-Record.

Chief Sewer Engineer. Fort Wayne, Indiana. Population—approximately 155,000. Must be or immediately become registered in the State of Indiana as a Professional Engineer. Degree in Civil Engineering or equivalent experience, plus a record of progressively responsible supervisory experience in the design, construction and operation of sewer systems. Salary range: $8000 to $9500. Send complete resume to: Chief Engineer, City Utilities, 425 So. Calhoun Street, Fort Wayne, Indiana.

Structural Engineer—3 to 5 years experience in industrial buildings and material handling systems. Must be familiar with shop details. Central Structural Design, 4037 Monroe Street, Toledo, Ohio.

Structural Engineer. Structural design in Architect's office, involving schools, hospitals, commercial work. Located Kansas City. Permanent position, opportunity for advancement. Starting salary $10,000. Give age, education and experience. P-4321, Engineering News-Record.

Experienced Concrete Paving Superintendent —Midwest Heavy Construction Firm. Ideal Working Conditions and Many Desirable Fringe Benefits. P-4359, Engineering News-Record.

Draftsman—experienced structural steel detailer and checker. Permanent position with established consulting firm. Fringe benefits. Submit resume of experience, references, and salary expected. Samborn, Steketee and Associates, Otis & Evans, 1214 Cherry Street, Toledo 4, Ohio.

Sanitary Engineer for large health department in rapidly growing county of 370,000 adjacent to Washington, D. C.; modern, spacious, air-conditioned building; minimum requirements—bachelor's degree plus four years experience. Salary—$8,000 to $9,762, five day work week, liberal sick leave, vacation and retirement benefits. Murray Grant, M.D., Prince Georges County Health Department, Cheverly, Md.

• POSITIONS WANTED

Project Manager—General Superintendent— Structural Engineer, not registered. Complete experience over thirty-five years in Estimating, General Superintendent, Job Superintendent, Project Manager and Contractor. Experience ranging on contracts up to Twenty-Five Million Dollars. Foreign or Domestic work acceptable. PW-4215, Engineering News-Record.

Building Construction Supt. or Ass't.—36, 12 years Gen. Contractor, bid to completion up to $100,000.00. Bonded. Fair Spanish. Prefer Latin America for a change. PW-4198, Engineering News-Record.

Sales Engineer: Structural, Rebar and allied products. Direct sales, estimating, engineering and product promotion with architects and engineers. Age 32, willing to relocate and travel. Desire position with aggressive company. PW-4208, Engineering News-Record.

Superintendent finishing million and quarter plant in Middle West for Chicago Contractor desires change. Middle Atlantic States preferred. PW-4226, Engineering News-Record.

• POSITIONS WANTED

Professional Pilot commercial & instrument ratings. Spanish speaking production expeditor. Presently employed Latin-American project nearing completion. Over 10,000 hrs. Perfect safety record. Sober, personable, responsible and dependable family man. References and resume on request. PW-4230, Engineering News-Record.

Const. Supt., Field Eng'r., BSCE, MSCE, Age 28, desires position with gen'l contractor, N. Y. or Conn. PW-4336, Eng. News-Record.

Electrical Supt. or Gen. Fore. Age 36—all types of elect. installations, excellent ref. Speak Spanish. PW-4338, Engineering News-Record.

Civil Engr., BSCE, Reg. PE, 37. Varied exp. including 8 years surveying in construction & land, 3 years evaluation & rates, prefer construction, Western U.S. only. PW-4345, Engineering News-Record.

Equipment Supt.; Master Mechanic; or similar classification. U.S., or O.S. Age 55. Univ. trained in accounting. Know the technical and economy of efficient equipment and tool operation, and, or maintenance. 15 of 40 years experience outside the U.S. Available on short notice. At present in South America. PW-4295, Engineering News-Record.

Contract Administrator, Project Manager, M.C.E. Age 34, 12 yrs. varied engineering experience, government construction contracts, plant maintenance, highway and heavy construction. Duties included management, supervision, estimating, purchasing; cost control. PW-4297, Engineering News-Record.

Soils Engineer (Civil), M.S., Licensed, several years varied soils experience. PW-4319, Engineering News-Record.

Construction—Project Engineer. 30 years experience practicing engineer, contracting and consulting on watersupply, sanitation, tunnel, bridge and heavy construction projects, design through construction. Registered. High professional standing. Available July for supervision construction large scale project or construction program for owner, consultant or contractor. PW-4326, Engineering News-Record.

Controller, B.S. in business, age 35—10 yrs. exp. light & heavy const. including Costs, Budgets, Gov. Claims, Bid Procedures, Office Mgr. PW-4302, Engineering News-Record.

Office Manager-Accountant — Experienced heavy construction. Field office or central office NCR machine accounting. Mid-west or West USA. Available. PW-4294, Engineering News-Record.

Secretary—15½ years construction experience. Know secretarial field and some accounting. Desire Southwest or West Coast. Available 30 days. PW-4322, Engineering News-Record.

Field supt. of heavy excavation and drainage, 25 years experience on big projects. PW-4273, Engineering News-Record.

Estimator-Superintendent thoroughly qualified to handle complete job bidding stage to completion. Public Works, Heavy Construction, Bridges, Commercial and Industrial Buildings. Best of references. Available immediately. Will relocate to suit job. PW-4265, Engineering News-Record.

Construction Supt. General Construction. PW-8896, Engineering News-Record.

Graduate Civil Engineer with five years of experience seeks position in Puerto Rico. Resume on request. PW-4357, Engineering News-Record.

• POSITIONS WANTED

Contractors Eng. 38—12 yrs. exp. Sewer & drainage projects, concrete structures, earthworks, buildings. Estimate, take-off, supervision. Locate Southwest or West. PW-4358, Engineering News-Record.

Field-office engr. layout, supervision, take off, etc. municipal, bldg. and heavy const. large or small firms, single. Location open. E. Brown, 600 N. 71st Ave., West Hollywood, Fla.

Executive—15 yrs legal-construction experience, Administrator, Mgr., Atty., Govt. Contracts, Claims. PW-4223, Eng. News-Record.

Ass't. Const. Supt. with mining company desires work with growing construction company west coast. PW-4379, Engineering News-Record.

Mech. Engr., married, age 38, 12 years experience, refrigeration, air conditioning, heating, plumbing, distribution systems, 3½ years working overseas on military projects. Desires overseas employment. PW-4383, Engineering News-Record.

Project Manager, construction supervision, Contract Administration. 22 yrs. exp. hvy. constr. major projects U.S. & O.S. PW-4373, Engineering News-Record.

Project Manager-General Superintendent— Bid to completion. Engaged in $1,300,000 Thermo Dynamics Lab.; desires to re-locate within 200 miles of central Jersey. Best references. Incl. management responsibility, contract negotiations, labor relations, purchasing, customer relations & negotiations. PW-4349, Engineering News-Record.

Construction man, graduate engineer available for reasonably high level position. 17 years construction experience, 10 of which were spent as head of medium-sized company doing general work with emphasis on engineering type construction. PW-4365, Engineering News-Record.

Civil Engineer, Registered, 41, 15 yrs. varied office exp. Design complete highway except bridges. Design sewers, flood control. Resume available. PW-4360, Engineering News-Record.

General Superintendent or Superintendent Age 37. Desire connection with firm specializing in industrial & commercial construction, vicinity of N. J. Have built mental institutions, missile bases, mass housing, and commercial buildings. Presently employed—need two weeks' notice. PW-4348, Engineering News-Record.

Party Chief and Inspector, 15 years experience, desires position overseas or Alaska. PW-4384, Engineering News-Record.

Estimator: 10 yrs. exp., industrial-commercial, desires position with reliable contractor doing above 5-million per year. Prefer commission basis. Resume on request. PW-4372, Engineering News-Record.

Chief Civil Engineer — $15,000. PW-4362, Engineering News-Record.

Engineer CE PE LS NJ Bus. Admin. experienced heavy construction supervision, estimating desires position general contractor. PW-4361, Engineering News-Record.

When Answering
BOX NUMBERS . . .

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

ENGINEERING CHECKER

FOR

DRAFTING DEPARTMENT

Man with 5 or more years of experience in checking of engineering drawings and calculations. Experienced in fields of process piping, materials handling, pressure vessels, structural steel and reinforced concrete, process equipment layouts and machine design.

35-50 years old and with a minimum of 2 yrs. of college engineering training.

Monsanto ®

Mr. Wm. R. Hayes, Asst. Dir. of Personnel Dept. 107

MONSANTO CHEMICAL CO

Inorganic Chemicals Division

St. Louis 66, Mo.

SALES ENGINEER

Excellent opportunity in Eastern Pennsylvania, Maryland and New Jersey sales territory, working out of Philadelphia district office of major chemical corporation for graduate engineer, over 27, desiring sales, promotion and construction work in expanding market. Highway and concrete engineering background desirable for contact with highway departments, contractors and concrete products companies.

Permanent position with excellent opportunity for advancement. Attractive salary, company car and expenses with liberal company sponsored benefits.

Contact Mr. T. D. Williams,

Columbia-Southern Chemical Corporation,
Subsidiary of Pittsburgh Plate Glass Co.,
One Gateway Center,
Pittsburgh 22, Pennsylvania

San Francisco

Refinery-Chemical Division and Power-Industrial Division offers immediate employment opportunities for engineers capable of assuming responsibility on design of major industrial projects such as refineries, petrochemical plants, and steam or hydro power plants.

Relocation allowances cover moving costs plus transportation reimbursement for you and members of your family. If you have an interest in a San Francisco assignment, please send a resume of experience to George I. Copeland, Manager of Personnel. Personal interviews will be arranged for qualified condidates.

Bechtel

Corporation

220 Montgomery Street

SAN FRANCISCO

In New York City, a personal interview can be arranged by phoning Paul Keating, MUrray Hill 7-7100.

SENIOR CIVIL ENGINEERS

Well known Southern California architect-engineering firm has immediate openings for Senior Civil Engineers who are experienced in Site Planning, Utilities Design, Facilities Layout, etc. State registration preferred.

Submit full particulars of education, experience, and earnings to: Box

P-4343—Engineering News-Record
68 Post St., San Francisco 4, Calif.

SENIOR PROCESS ENGINEERS

Permanent employment with an expanding company. Excellent advancement opportunities for men with at least 10 years experience in process design of petroleum and petro-chemical plants.

Send detailed resume to:

G. VICTOR HOPKINS

ARTHUR G. McKEE & CO.

2300 Chester Ave., Cleveland 1, Ohio

SALES ENGINEER

One of our progressive, expanding divisions has an excellent opening in the Chicago area for a man qualified to sell clamshell buckets and grapples.

This division manufactures an extensive line of buckets and grapples for the steel industry, industrial and contracting business.

Qualifications: Prefer M.E. degree with sales experience along these lines. Craneway, crawler, overhead and locomotive type crane experience will be given consideration.

Compensation: Salary—plus expenses—plus fringe benefits to include insurance, pension, savings and vacation. Send complete qualifications and salary desired to

BLAW-KNOX COMPANY
300 Sixth Avenue, Pittsburgh 22, Pa.
J. J. Zimmerman

CONSTRUCTION SUPERINTENDENT

Minimum 15 years experience in chemical plant construction. Graduate civil or mechanical engineer preferred. Must be willing to relocate within United States.

Reply fully and in confidence to:

PAUL S. MONROE
Vice-President

SD PLANTS INCORPORATED

2 Park Avenue
New York 16, N. Y.

ENGINEERS

DEPUTY MANAGER

FOREIGN OPERATIONS

We are seeking an extremely competent licensed Engineer, preferably Civil, to serve as Deputy Manager of our large and varied Overseas Operations. This individual must have senior experience in management of diversified operations within the field of planning and design and including estimating, specifications, purchasing, etc. relative to large engineering services contracts for major construction and study projects. Several years of his experience should be as Project Manager in charge of overseas engineering projects.

While the office will be located in Southern California travel to various overseas areas will be required from time to time. Individual may in future, if necessary, go out as Project Manager on a major project.

Our need is immediate. U. S. Citizenship is required, and we prefer age 35-50. Please submit a concise resume including previous and expected salaries.

Box P-4356, Engineering News Record
1125 W. 6th St., Los Angeles 17, California

CONSTRUCTION MANAGER

With heavy experience background in dams, tunnels and hydroelectric projects. Work domestic or foreign. Salary commensurate with experience. Write:

P-3097, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

WANTED

PLANT ENGINEER for opening with large North American mining company for assignment at smelting and refining center in Peru.

Engineering degree, plus 10 years' experience in plant engineering, covering administration, and supervision of maintenance program, utilities, and wide-range of shop facilities. Age to 50, salary commensurate with experience. Transportation, housing, plus other benefits. Reply with full particulars to

P-4363, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

OPPORTUNITY

SALES MANAGER, Age 35 to 43
Salary $12,000 + Expenses + Bonus
Can Purchase Part Interest on Earnings.
LOCATION—Eastern New York State

Long Established Business. Distributorship Heavy Construction Machinery.
Tractors, Excavating Machinery, Aggregate, Asphalt and Concrete Processing Plants.
Preference experience in design and Estimating and selling aggregate, and Asphalt and Concrete Plants.
Eligible candidates reply immediately.
All information furnished to be held in strict confidence.

P-4354, Engineering News-Record
68 Post St., San Francisco 4, Calif.

SAFETY DIRECTOR

Major construction company offers outstanding opportunity to man with experience in construction safety. Send resume to:

P-4335—Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

SEARCHLIGHT SECTION

CLASSIFIED ADVERTISING

Send New ADS or Inquiries to Class. Adv. of Engineering News-Record, P. O. Box 12, New York 36, N. Y., For May 26th Issue Closing May 16th

CONSTRUCTION SUPERVISION

Exclusive Training Course by mail for top positions. Publishers Manual of Advanced Construction Management. Send postcard for details.

National Schools of Construction
Est. 1952
Satsuma, Florida

STRUCTURAL ENGINEERING

ARCHITECTURAL ENGINEERING

OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-eighth year. Write today without obligation.

WILSON *Engineering Corp.*

College House Offices HARVARD SQ., CAMBRIDGE, MASS.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• CONTRACT WORK WANTED

Structural, Mechanical, Electrical—15-man group of licensed engineers (4), designers and draftsmen for all types of structures, heating, air conditioning, steam, water and process piping, power wiring and lighting. Immediately available. CWW-4382, Engineering News-Record.

• BUSINESS OPPORTUNITIES

Engineer with proprietary foundation pile and technique seeks financial associate with engineering or heavy foundation experience for development of same. Several years of consistent profits in U. S. and overseas. BO-4221, Engineering News-Record.

Engineering and Surveying practice with necessary equipment for sale in fast growing Florida community. BO-4260, Engineering News-Record.

Construction corporation with $50,000.00 loss for tax credit available. Write Constructors, 502 Mile High Center, Denver 2, Colorado.

Important French Metalworking Company situated in Eastern France, has available large plant, permanent employees and financial means, is interested in an arrangement with American company on equal basis, or in manufacture under license, for mass production to European Common Market.

Write **E 4.316** Contesse Publicite
20, avenue de l'Opera, Paris 1, France
who will forward inquiries.

GENERAL CONTRACTOR

Nationally known, operating country wide, wants subcontractors for all trades. If you want to be placed on our list, write giving full information as to size, type and geographical coverage of jobs.

M-4353, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Wanted License To Manufacture in Europe

Industrial organization specializing in building of Heavy Machinery (40 ton units) Special Machines Automation—Materials Handling and Continuous Production Systems — Finishing Machines — Moulding — Machines — Joining Machines — Splitting (Cleaving) Machines — etc. . . . is seeking a license, or other, arrangement, such arrangement could include manufacture of machinery used in Public Works, Hydraulics, Mechanical Construction, Electrical Construction, Pneumatics.

Please write to:

No. E 4.322 Contesse Publicite,
20, av. Opera Paris, France

FOR SALE

EUCLIDS: Rear, Bottom and Scrapers
15W Bucyrus-Erie Dragline, 14 yd.
9W Bucyrus-Erie Dragline, 8 yd.
7W Bucyrus-Erie Dragline, 7 yd.
5W Bucyrus-Erie Dragline, 5 yd.
200W Bucyrus-Erie Dragline, 6 yd.
170B Bucyrus-Erie Shovel, 6½ yd.
120B Bucyrus-Erie Shovel, 5 yd.
54B Bucyrus-Erie Shovel, 2½ yd.
38B Bucyrus-Erie Shovel, 1½ yd.
80D Northwest Shovel, 2½ yd.
4500 Manitowoc Dragline, 5 yd.
3000 Manitowoc Dragline, 1¾ yd.
2400 Lima Dragline, 6 yd.
1201 Lima Dragline, 3 yd.
1½ yd. Marion Shovel. New in 1956
7400 Marion Walking Dragline, 9 yd.

SHOVELS—DRAGLINES—CRANES
(All sizes, makes, Crawler and walking type)
WILLIAM LUBRECHT, III
Construction Equipment
311 W. Diamond Ave. Hazleton, Pa.
Telephone GI 5-4041 or 5-0253

FOR SALE

Used Equipment as listed, all in good to very good condition; priced to sell:

120 yd. Johnson semi-automatic concrete batch plant; five compartments (one cement) —bulk cement under track truck loader—100 Bbl. bulk cement tank trailer—35,000 sq. ft. Atlas (Irvington) steel speed forms; and 3,000 sq. ft. Economy steel forms for concrete walls—L-41 Lorain crawler crane, 1948, SN 18554—Northwest 95 crawler crane, SN 12527—P & H crawler crane, model 855 LC, diesel, SN 10572, 1946—P & H crawler crane 855-D, SN 10984 (Lorain and P & H cranes have shovel front and backhoe attachments)—Kwik-Steam generator, Littleford, model 3600-G—3 TD-24 bulldozers, SN 1914, 2024, 4266—2 Chester 5' diam. dual tandem sheepsfoot rollers—Foote 34E paver, SN 49211—Multi-Foots 34E paver, SN 48020 —10 ton, 3 wheel Huber roller, SN 10821— Rome Disc plowing harrow, model TMR 24-30—2 315 Schramm portable air compressors—2 Moretrench well-point pumps complete with 600' pipe main—120 ton Blaw-Knox concrete aggregate weigh bins.

Write P. O. Box 402, Barre, Vermont

FOR SALE

STEEL PAVING FORMS

3600 FT. 12" x 14" Dual Purpose
3000 FT. 15" x 15" Single Face
500 FT. 14" x 14" Single Face

PERINI CORP., Framingham, Mass.
Tel. TRinity 5-6171

FOR SALE

Steel Truss Bridge, 2 main sections @ 350 ft. each, dual lane, bolted—weight 718 tons.
American R-25 Revolver Crane
(10) 2 c.y. Johnson Conc. Buckets
(2) 8 c.y. Garbo Conc. Buckets
(3) Wagon Drill/Feed-I.R.-FM3
(1) Wagon Drill-D99 Gar. Denver
(1) Sand Dryer Assembly
(1) Joy Challenger 500
(1) Air Trac, Joy 400
(2) Olson Cement Bulk Trailers, Model OS35
(9) 8-Bag Sandblast Machines
(1) Southwest Compactor, Mod. 2DH-RR
(2) Frink Snowplows, Model 440 & 361RT.

WALSH, PERINI, MORRISON, KIEWIT, UTAH COMPANIES
P.O. Box 106 Massena, N. Y.

EQUIPMENT FOR SALE

Barber-Greene 6000# Batch-O-Matic Asphalt Plant
Barber-Greene Finishers
Tandem & 3 axle rollers
Koehring 34-E Dual Drum Concrete Paver
Bulldozers—Caterpillar D8s—15-A Series
Graders—Caterpillar #12s—8 T Series
Shovel—Bucyrus Erie 38-B—with attachments
Shovel—Bucyrus Erie 22-B—with attachments
Truck Crane—Bucyrus Erie—22-B
Gradall—with attachments—one year old.

ALEXANDER CONSTRUCTION CO., INC.
2407 N. Market St. Twin Oaks, Pa.
HU 5-5856

FOR SALE OR RENT

4—Model C. Tournapulls
1—D-8 Caterpillar Dozer, D. D. P. C. U.
1—D-8 Caterpillar, D. D. P. C. U.
1—Model 502 Tampco D. D. Sheepfoot Roller
1—10 Ton, Three Wheel Roller

All Good Working Condition.

RAY D. BOLANDER COMPANY, INC.
8014 East 45th St., Indianapolis 26, Indiana
Phone Liberty 6-1577

CONCRETE PAVING EQUIPMENT

FOR SALE

1—Koehring 34-E Dual Drum Paver, Diesel powered w/ latest accessories.
3350'—17" x 17" x ¼" x 10' Heavy Duty Airport Forms
1—Heltzel 3 compartment Aggregate Bin w/ dual weighing hoppers, 100 Ton
1—Heltzel 300 Bbl. Bulk Cement Plant w/ dual weighing hoppers and w/ 150 Ton Elevator.

W. L. JOHNSON CONSTRUCTION COMPANY AND ASSOCIATES
P. O. Box 6668, Bexley Station
Columbus 9, Ohio Phone: TEmple 3-1327.

BAILEY BRIDGES

SALES — RENTALS

BAILEY BRIDGE RENTALS & EQUIPMENT
1325 Archer St. P. O. Box 753
San Luis Obispo, Calif.

FOR SALE

1—Used Lima Model 1201, New Cummins Engine and Undercarriage Rebuilt in 1958

1—Used Garwood Buckeye Trencher Model 407. New in 1958

1—Used Manitowoc 3900

1—Used Manitowoc 3500

MANITOWOC-FORSYTHE CORPORATION
37-11 Vernon Blvd.—EXeter 2-6125
Long Island City 1, New York

SAVE ON YOUR
TRACK CHAINS ROLLERS SPROCKETS IDLERS, ETC.
for Caterpillar—International—Allis Chalmers
BRAND NEW—GUARANTEED
SEABOARD EQUIPMENT CO., INC.
161-10B Jamaica Ave., Jamaica 32, N. Y.
AX-7-4422

SURVEYING INSTRUMENTS

USED • REBUILT • SALE
RENT • REPAIRING

TRANSITS AND LEVELS

New or Rebuilt
Sale or Rent

Headquarters for REPAIRS — any make — Factory Service We will also buy your old instruments or take them in trade.

A complete line of Engineering Instruments and equipment for field or office. Write for catalog NRL 105.

WARREN-KNIGHT CO.
Manufacturers of Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

ALL MAKES
RE-BUILT REPAIRS RENT REAL EXPERTS
BUFF

69 Dey St., New York WOrth 2-2797

TRANSITS & LEVELS
Various Makes
NEW & REBUILT

Fully equipped modern shops — all makes and models repaired — all work guaranteed — prompt service — complete line field supplies.

INSTRUMENTS RENTED

Midwest Distributors for W. & L. E. Gurley and Wild Heerbrugg Instruments

NATIONAL BLUE PRINT CO.
Established 1918.
210 S. Canal St. Chicago (6), Ill.

HEAVY EXCAVATION EQUIPMENT
DRAGLINES, SHOVELS, CRANES, DRILLS, TRUCKS

15-W B.E. Elec. Drag, 215', 12 yd.
450-W B.E. Diesel Drag, 165' w/ extra 10, 12, 13 and 14 yd. buckets
9-W B.E. Elec. Drag, 165', 10 yd.
9-W B.E. Diesel Drag, 165', 12 yd.
7-W B.E. Diesel Drag, 140', 7 yd.
7400 Marion Diesel Drag, 175', 13 yd.
7400 Marion Elec. Drag, 175', 12 yd.
625 Page Diesel Drag, 160', 9 yd.
621-S Page Diesel Drag, 125', 7 yd.
200-W B.E. Diesel Drag, 125', 6 yd.
2400 Lima Elec. Drag, 130', 6 yd.
2400 Lima Diesel Drag, 130', 6 yd.
4500 Manitowoc Drag, 120', 5 yd.
120-B B.E. Elec. Drag, 115', 5 yd.
71-B B.E. Crane with 160' boom
3900, 3500 & 3000 Manitowoc Cranes
111-M Marion Drag, 100', 4 yd.
1601 Lima 4 yd. Shovel/Drag
1055 P&H Drag, 80', 3½ yd.
1201 Lima Drag, 85', 3 yd.
54-B B.E. Drag, 80', 2½ yd.
5560 Marion 26 yd. Elec. Shovel
151-M Marion 7 yd. Elec. Shovel
1600 P&H 6 yd. Elec. Shovels
170-B B.E. 6 yd. Elec. Shovel
4161 Marion 6 yd. Elec. Shovel
2400 Lima 6 yd. Std. & H.L. Shovels
120-B B.E. 4 yd. Elec. Shovel
111-M Marion 4 yd. Standard Shovel
1201 Lima & 54-B B.E. Standard Shovels
#6 Northwest 1½ yd. Standard Shovel
Model T-650 REICHdrill Truck Mounted Rotary and Down-The-Hole
Ingersoll-Rand Truck Mtd. & Crawler Mtd. Drillmasters
Euclid Trucks, Rr. & Bottom Dump; Dozers, etc.

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa., Gladstone 5-3658

FOR SALE OR RENT

2½ YD. LINK-BELT CRANE-DRAGLINE. K-595. 140' BOOM & JIB. CATERPILLAR D-17000 ENGINE.
1 YD. LORAIN L-50. 60' BM. GM DIESEL. NEW 1951.
40/50 TON AMERICAN DIESEL LOCO. CRANE.
25 TON BROWNHOIST DIESEL LOCO. CRANE.
45 TON GEN. ELEC. DIESEL ELEC. LOCOS.
25 TON GEN. ELEC. DIESEL ELEC. LOCO.
75 TON WHITCOMB DIESEL ELEC. LOCO. 500 HP CAT. NEW 1951.

WHISLER EQUIPMENT CO.
1905 Railway Exchange Bldg., St. Louis 1, Mo.
CHestnut 1-4474

FOR RENT

3—80D Shovels 2½ c.y.
8—DW21 Cat Scrapers
7—Rear Dump Euclids
8—D8 Cat Dozers

N. R. CORBISELLO, INC.
BOX 45 Binghamton, New York
RAymond 4-1107

RAILS-TIES

TRACK ACCESSORIES

RAILROAD Cross and Switch TIES

Promptly from adequate stocks
NEW and USED *(as available)*
GILLIS & COMPANY
134 Breckenridge Lane Louisville 7, Ky
TW 5-9484

SPECIALS

USED EQUIPMENT LIST

1—Model QM Ingersoll-Rand Quarrymaster Track Mounted with Model KA-500 Compressor
1—DM3-RD-DH325A Ingersoll-Rand Drillmaster complete with DR-600 Compressor
4—Model "D" Tournapulls
3—Model "C" Tournatractors
1—Model "B" Tournapulls
1—Model K30 Rooter (LeTourneau)
1—Model 5620 Seaman-Andwall Pneumatic Compactor
1—Model 420 John Deere Crawler Tractor with C-10H Henry Backhoe and TS40 F Henry Loader
1—Model 650 Ford with Shawnee Loader
1—427AWP Pettibone Mulliken Speedswing, Backhoe attachment, Tote Hook, ⅜ Yd. Bucket 1¼ Yd. Loader
1—Model 35-M Marion Backhoe
1—Shovel Front Lima ¾ Yd.
1—Model 820-K Lorain 2 Yd. Shovel
1—Model 1020 Unit Shovel
2—Super A Tournamatic Tournapulls

NEW EQUIPMENT AT BARGAIN PRICES

3—Model 320-U John Deere Tractors
2—40 MB Sweeper Attachments
1—Model 420-C John Deere Tractor with 61 Angledozer and C-10H Henry Backhoe
1—Model 420-C John Deere Tractor with Ashland Angledozer
1—Model 420 Crawler Tractor with Maine Bulldozer
1—Hancock 8 Yd. Elevating Scraper
2—1 Yd. Overland Scrapers
1—61 John Deere Angling Bulldozer
1—MD5 Danuser Post Driver
1—Holt Heavy Duty Angledozer for 420-C John Deere
1—Model 250D Pettibone Mulliken Speedail Loader

FURNIVAL MACHINERY CO.
Lancaster Avenue at 54th Street
Philadelphia 31, Pa.
TRinity 7-5200

Harrisburg, Pa., 5101 Paxton Street, JOrdan 4-1781
New Philadelphia, Pa. Water Street
MArket 2-8020
Wilkes-Barre-Scranton, Route 315, OLympic 5-2230

ABOVE OFFERED SUBJECT TO PRIOR SALE OR OTHER DISPOSITION

CRANES FOR RENT

CRAWLERS Capacities to 60 tons Booms to 180 ft.
TRUCK CRANES Capacities to 35 tons Booms to 130 ft.

P & H, Lima and Manitowoc.
Top-Condition erection cranes

ROGER SHERMAN
CRANE SERVICE, INC.
East Hartford, Connecticut JAckson 8-4106

FOR SALE

7—Used Joy TWM-5 Challenger Crawler Drills with TM 500 hammers, 30 ft. steel change and dust filter units.
4—Used Joy TM-500 Hammers.
Approx. 9,000 feet 2" Drill Steel, 30 ft. lengths.
200,000 FBM 12" x 12" Structural Pine Timbers, 26 ft. and 30 ft. lengths.
8—36" WF 280# Beams, 80 ft. lengths.
32—30" WF 116# Beams, 40 ft. lengths.

BALF-SAVIN-WINKELMAN
P. O. Box 592 Niagara Falls, New York

LOW COST INSTALLATION AND OPERATION

CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM OR DIESEL
CAPACITY 3 TO 20 TONS
SELL, RENT OR BUY

FOR DAMS BRIDGES BREAKWATERS FILTRATION AND SEWERAGE PLANTS
FOR SPEED ECONOMY EFFICIENCY FLOOD SAFETY LABOR REDUCTION

AMBURSEN DAM CO. INC.
295 MADISON AVE. NEW YORK

PORTABLE CRUSHING PLANT

Cedarapids 1836 Twin Jaw Roller Bearing Portable Crushing Plant, complete with drives, 30" x 27' Channel Frame under Crusher Conveyor, 30" x 8' reciprocating Feeder with adjustable throw eccentric clutch, stationary grizzly bypass chute, hopper, feeder supports, conveyor supports, walkway platform with expanded metal flooring for Crusher, powered by Model 6038C G. M. Diesel Engine, 12" truck frame and Cedarapids tandem rear axle assembly with oscillating beams, air brakes, wheels, 8—9.00 x 20—12 ply Goodrich tires. Excellent condition, used very little. Savings to 40% of new unit price. Available immediately. Subject to prior sale or disposition.

L. B. SMITH, INC.

357 W. Fayette St. Syracuse, N. Y.

Phone: GRanite 5-2196

FORSYTHE EQUIPMENT CO., INC.

MANITOWOC SPEEDCRANES

RENTALS

Capacities to 70 Tons
Booms to 140 ft. and 30 ft. jibs
Special rates on long rentals

Exeter 2-6125 37-11 Vernon Blvd.
Long Island City 1, New York

NEW FLOATING CRANE

FOR SALE

50 Tons Cap. @ 40' Radius
100' Boom - 4 drum Hoist

Havre de Grace Shipyard, Inc.
Havre de Grace, Md.

FOR SALE
Dump and Diesel Engine

1—DeLaval pump—Style 249893
G.P.M.—20850—Head 70' Speed—665 R.P.M.
1—Chicago Pneumatic 580 H.P. Diesel Engine
Type 812-C.P. 665 R.P.M. Motor No. 42173

ANXIOUS TO SELL—MAKE OFFER

City of Rochester
DeWayne Day, *Director*, Water Bureau
10 Felix Street Rochester 6, New York
Telephone—GLenwood 3-0051

PIPE

Surplus New & Used

FOR SALE, WANTED OR RENT

PILING

SURPLUS NEW and USED **For Sale, Wanted or Rent**

PIPE

90000' 6⅝" .156 wall prime X 42 grade B tested 1500# pipe $1.10 foot
33000' 6⅝" .188 wall prime X 42 grade B tested 1500# pipe $1.45 foot
33000' 6⅝" .149 wall prime grade B tested 1500# pipe $1.05 foot
21000' 6⅝" .219 wall prime grade B tested 1500# pipe $1.50 foot
All above pipe located in Long Beach, California.
7000' 24" OD 5/16 wall X 42 grade B E. W. prime pipe $6.75 foot
This pipe above is located in Little Rock, Arkansas.
Other sizes 2" thru 20" 3/16 and heavier.

DALTON PIPE CO.
3291 Cherry Ave., Long Beach 7, Calif.
Garfield 40431

We do a Nation-wide business in

STEEL SHEET PILING

IMMEDIATE SHIPMENT

815 pcs. 75 to 30 ft. Beth. SP-6a—New York
100 pcs. 62 ft. Beth. ZP-32—Connecticut
103 pcs. 60 ft. MZ-27—Tennessee
150 pcs. 60 ft. SP-4—W. Virginia
290 pcs. 60 to 30 ft. M-16 & M-115—Tennessee
370 pcs. 60 to 30 ft. M-115 & M-116—Indiana
150 pcs. 34-30 ft. M-116—Michigan
81 pcs. 25 ft. M-115—Mississippi
220 pcs. 15 ft. M-115—Missouri
Other lengths and sections at various locations. Storage yards at CHICAGO, BUFFALO & MEMPHIS.
Also 10" x 42# and 12" x 53# BP 60' in stock.

PILE DRIVING EQUIPMENT

VULCAN AND McKIERNAN-TERRY PILE HAMMERS & EXTRACTORS

All Sizes—For Rent & Sale—Immediate Shipment

MISSISSIPPI VALLEY EQUIPMENT CO.

1908 Railway Exchange Bldg.
St. Louis 1, Mo. CHestnut 1-4474

STEEL SHEET PILING

AVAILABLE FOR PROMPT SHIPMENT

Pcs.	Section	Length	Location
350	MP-112	60 to 64 ft.	Arkansas
275	MP-116	20 to 60 ft.	Chicago
250	MP-115	20 to 60 ft.	Chicago
80	MP-116	28 to 29 ft.	South Dakota
200	MP-115	20 to 60 ft.	Kansas City
175	MP-116	20 to 60 ft.	Kansas City
95	Mp-112	18 to 25 ft.	Kansas

CONMACO, INC.

PHONE DRexel 1-3930
804 KANSAS AVE., KANSAS CITY, KANSAS

Call: HYACINTH 7-4900

PIPE, VALVES & FITTINGS

PILING • CULVERTS
ASBESTOS-CEMENT PIPE • ALUMINUM PIPE

ALBERT PIPE SUPPLY CO., Inc.

103 VARICK AVE., BROOKLYN 37, N.Y.

STEEL SHEET PILING

LARSSEN and ROMBAS Sections

STOCKS AVAILABLE IN:
- Linden, New Jersey
- Ft. Lauderdale, Florida
- Houston, Texas

WESTERN SERVICES CORPORATION

601 E. Linden Ave., Linden, N. J.
MArket 4-4000 HUnter 6-4000

In Florida Call: Port Everglades Steel Co. Ft. Lauderdale—JA. 4-6545
In Houston Call: G. Oliver—CA. 4-7234

DAVIDSON

PIPE SUPPLY CO. INC.

Seamless and Welded Steel Pipe
Fittings, Valves, Pipe Fabricating

Call GEdney 9-6300
50th St. & 2nd Ave., B'klyn 32, N. Y.

H & SHEET STEEL PILING

3700 PCS. BETH. SP6A, 50' 56' & 48' & 40' & 35'
1900 PCS. MP112—12', 25', 35', 40', & 60'
2800 PCS. BETH.—AP3 20', 25', 30', 35', & 60'
2500 PCS. BETH.—DP2—31', 35', 40', 50', 60'
1200 PCS. ZP38-ZP32—25', 36', 50', 60' & 65'
1400 PCS. BP8, BP10, BP12—BP14—55' to 60'
600 PCS. BETH. ZP27—25', 30', 50' & 60'

PILING BOUGHT—SOLD—RENTED
STOCKS: N. Y.—BOSTON—BUFFALO
TORONTO—BALTIMORE—JACKSONVILLE
MIAMI—RICHMOND—NEW ORLEANS

DIESEL LOCOMOTIVES & CRANES

12—Gen. Elec. 100, 80, 65, 45, 25 & 23 ton
25 Ton New Whitcomb Diesel Elec.
25 Ton Industrial Loco Crane, 60' Boom

20 TON STIFF LEG DERRICK

1—AH&D, 40' Mast, 96' Boom, 16' BW

R. C. STANHOPE, INC.
60 E. 42nd St. N. Y. 17, N. Y.
Telephones MU 2-3075 or MU 2-1898

ASSOCIATED PIPE & FITTING CO., INC.

PILING PIPE SHELLS MANDREL FITTINGS
"H" BEARING PILE SLEEVES AND SHOES
K & M ASBESTOS CEMENT PIPE
CULVERTS CIRCLE ARCH SECTIONAL

262 RUTHERFORD BLVD., CLIFTON, N.J. • PR 3-8400

H-BEARING PILES

8" x 36#—12" x 53#
10" x 42#—14" x 73#

Immediate Shipment — Other Sizes Available
Chicago—Buffalo—Memphis—Cincinnati
Steel Sheet Piling—Pile Hammers

WHISLER STEEL PILING CO.

CHestnut 1-4474
1908 Railway Exchange Bldg., St. Louis 1, Mo.

"FASTER FROM FOSTER"

STEEL SHEET **PILING**

All sections from our regular stocks

L. B. FOSTER CO.

PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
CHICAGO 4 • HOUSTON 2 • LOS ANGELES 5

STEEL PIPE up to 48" O.D.

WELDING FITTINGS
FLANGES • VALVES

The IDEAL SUPPLY CO.

445 Communipaw Ave.
Jersey City, N. J., DElaware 3-2600
New York Phone: Digby 9-2454

STEEL PIPE

NEW — STRUCTURAL — RECONDITIONED
VALVES & ALL TYPE FITTINGS
COMPLETE FABRICATION FACILITIES

GREENPOINT PIPE SUPPLY CORP.

341 Stagg Street, Brooklyn 6, N. Y. EV. 6-7200

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names — **Additional cards on following pages**

NEW ENGLAND

Goodkind & O'Dea

Consulting Engineers
Design and Supervision
Foundations, Structures, Highways
1214 Dixwell Ave. Hamden, Conn.
610 Bloomfield Ave., Bloomfield, N. J.
325 Spring Street, New York 7, N. Y.
108 W. Lake Street, Chicago 1, Ill.

John Clarkeson

Consulting Engineer
Civil Engineers—Consulting Services
Highways, Airports, Bridges
Surveys, Waterfront Facilities
Room 203, Del & Hudson RR Bldg.
Albany, N. Y.

Fay, Spofford & Thorndike, Inc.

Engineers

Industrial Plants Incinerators
Water Supply, Sewerage, Drainage
Bridges Express Highways
Port and Terminal Work Airports

Designs Investigations
Supervision of Construction

Boston 8, Massachusetts

Jackson & Moreland, Inc.
Jackson & Moreland Int'l., Inc.

Engineers and Consultants
Electrical—Mechanical—Structural
Design and Supervision of Construction
for
Utility, Industrial and Atomic Projects
Surveys—Appraisals—Reports
Machine Design-Technical Publications
Boston Washington New York

Chas. T. Main, Inc.

Engineers
Design and Supervision of Construction for Industrial Plants—Electrical, Steam and Hydraulic Engineering—Investigations, Reports, and Appraisals.
Boston, Mass. Charlotte, N. C.

Metcalf & Eddy

ENGINEERS
Investigations Reports Design
Supervision of Construction
and Operation
Management Valuation Laboratory
1300 Statler Building, Boston 16

Moore Survey & Mapping Corp.

Engineers-Photogrammetrists-Surveyors
Geodetic Control—Construction Layout
Aerial Topographic Surveys—Tax Maps
Hydrographic Surveys—Photogrammetry
29 Grafton Circle—Shrewsbury, Mass.

MIDDLE ATLANTIC

Airways Engineering Corp.

Airports, highways, dams, fuel storage, pipe lines, aerial topographic mapping.
1212 - 18th St., N.W.,
Washington 6, D. C.
Phone: REpublic 7-8131

Quick

solutions to your technical problems are available through these consultants. Think first of the Professional Services Section of your publication when considering calling in an expert.

Ewin Engineering Corporation

Designers of Port Facilities, Foundations, Industrial Plants, Bridges, Highways, Sewage Disposal and Municipal Projects.

5104 MacArthur Blvd. N.W.
Washington, D. C.

DuPont Plaza Center, Miami 32, Fla.
150 Savannah St. Mobile, Ala.

Benjamin E. Beavin Company

Drainage, Water, Sewerage, Grading, Soils & Geologic Engineering
Ports, Airfields, Highways, Structures
104 E. 25th St., Baltimore 18, Md.

J. E. Greiner Company

Consulting Engineers

Airports - Bridges -
Buildings
Highways & Expressways -
Port Facilities

1106 N. Charles St., Baltimore 1, Md.

Whitman, Requardt & Associates

Engineers—Consultants
Civil—Sanitary—Structural
Mechanical—Electrical
Reports, Plans, Supervision, Appraisals
1304 St. Paul St., Baltimore 2, Md.

Louis Berger & Associates

Consulting Engineers
Studies, Design and Supervision
Highways—Structures
Airfields—Foundations
177 Oakwood Avenue Orange, N. J.
2nd & Locust Streets Harrisburg, Pa.
200 S. Main St. Salt Lake City, Utah
40 rue du Rhone Geneva, Switzerland

Joseph S. Ward

Consulting Soil and Foundation Engineer
Site Investigation, Boring Supervision, Laboratory Soil Testing, Foundation and Pavement Analysis and Design, Construction Supervision, Engineering Reports and Consultation
91 Roseland Avenue Caldwell, N. J.

Edwards and Kelcey

Engineers and Consultants
Highways—Structures—Airports
Traffic—Parking—Soils
Ports—Parks—Sewerage
3 William St., Newark 2, New Jersey
Boston Providence New York
Salt Lake City Minneapolis

Porter, Urquhart, McCreary & O'Brien

O. J. Porter & Co.
CONSULTING ENGINEERS
Airports — Highways — Expressways — Buildings — Bridges — Dams — Harbors — Foundations — Stabilization — Pavements
Reports, Designs & Supervision
415 Frelinghuysen Ave., Newark 5, N.J.
4201 Sunset Blvd. Los Angeles 29, Cal.
1421 - 47th Avenue Sacramento 22 Cal.
1140 Howard St. San Francisco 3, Cal.
421 Minor Ave. N. Seattle 9, Wash.

Boswell Engineering Co.

Consulting Engineers
Highways, Bridges, Airports, Municipal
Ridgefield Park, N. J.
West Nyack, New York
Salt Lake City, Utah
Anchorage, Alaska

ALWAYS READY

Yes, these consultants are always ready to help you with any problem concerning engineered construction. Call on them with the assurance that you will be receiving the finest of professional advice.

B. K. Hough

Consulting Engineer
Soils & Foundation Engineering
Site investigations, soil testing, design analysis for earthworks, foundations and pavements, field inspection, engineering reports, consultation.
121 E. Seneca St. Ithaca, New York

M. C. Tomasetti

Consulting Engineers—Surveyors
Designs, Construction Supervision
Highways—Airfields—Structures
Soils—Foundations—Pavements—Drainage
Materials Investigations
Site Designs, Subdivisions, Surveys
Greenwich, Conn., New Rochelle, N. Y.

Ammann & Whitney

Consulting Engineers

Design and Supervision of Construction of Bridges, Highways, Expressways, Buildings, Special Structures, Airports and Airport Facilities

111 Eighth Avenue, New York 11, N.Y.

Milwaukee - Washington - Philadelphia
Paris - Athens - Tehran

Blauvelt Engineering Co.

CONSULTING ENGINEERS

Highways,
Bridges,
Reports

New York, N. Y. Philadelphia, Pa.
Woodbury, N. J. Crystal Lake, Ill.

Clinton Bogert Engineers

Consultants
Clinton L. Bogert Ivan L. Bogert
Donald M. Ditmars Robert A. Lincoln
Charles A. Manganaro William Martin
Water & Sewage Works Incinerators
Drainage Flood Control
Highways and Bridges Airfields
145 E. 32nd St., New York 16, N. Y.

Bowe, Albertson & Associates

Engineers
Water and Sewage Works—Industrial Wastes—Refuse Disposal—Valuations—Laboratory Service
75 West St. 1000 Farmington Ave.
New York 6, N.Y. W. Hartford 7, Conn.

Buck, Seifert and Jost

Consulting Engineers
Water Supply — Sewerage — Hydraulic Developments—Reports and Valuations, Chemical and Biological Laboratories,
New York City, 112 E. 19th St.

Ebasco Services Incorporated

ENGINEERS
CONSTRUCTORS
BUSINESS CONSULTANTS
Design and Construction
Financial and Operating Consultation
Investigations and Reports
Consulting Engineering
Appraisals
Two Rector Street, New York 6, N. Y.
140 S. Clark Street, Chicago 3, Ill.
1416 Commerce Bldg., Dallas 1, Texas
611 Equitable Bldg. Portland 4, Ore.
120 Montgomery Street,
San Francisco 4, Cal.
1625 Eye Street, N.W. Wash. 6, D. C.

Gibbs & Hill, Inc.

Consulting Engineers
Water, Sewage & Industrial Waste Treatment Works — Roads, Bridges & Railroads—Conventional & Nuclear Power Generation — Electric Transmission & Distribution Systems—Industrial & Communication Facilities.
PENN STATION NEW YORK 1, N.Y.

Frederic R. Harris, Inc.

Consulting Engineers
New York, N. Y.
Norwalk, Conn. New Orleans, La.
Toronto, Canada The Hague, Holland

Hardesty & Hanover

Consulting Engineers

Bridges
Fixed and Movable
Highways
Expressways, Thruways
Special Structures
Design, Supervision,
Inspection, Valuation

101 Park Avenue New York 17

Hazen and Sawyer

Engineers
Richard Hazen Alfred W. Sawyer
H. E. Hudson, Jr.
Water and Sewage Works
Industrial Waste Disposal
Drainage and Flood Control
360 Lexington Ave., New York 17, N.Y.

Howard, Needles, Tammen & Bergendoff

Consulting Engineers
Bridges, Structures, Foundations,
Express Highways
Administrative Services
Kansas City - Cleveland - New York

King & Gavaris

CONSULTING ENGINEERS

Bridges, Highways, Tunnels
Waterfront Structures, Reports
Investigations, Foundations
Design & Supervision of Construction

41 E. 42nd St., New York 17, N. Y.

Litchfield Whiting Bowne & Assoc.

Engineers—Architects
Sewage, Water, Bridges, Airports, Flood Control, Electrification, Hospitals, Schools, City Planning, Abbatoirs, Highways, Air Conditioning, Industrial Buildings, Military.
292 Madison Avenue, N. Y. 17, N. Y.
Rome Tehran Bangkok

Marbarry Corp.

Design and Drafting Service
Construction Cost Consultant
33 Rector St. New York 6, N. Y.
WH 4-5160

Modern Engineering Corporation

Design—Consulting
62 William Street, New York, N. Y.

Moran, Proctor Mueser & Rutledge

Consulting Engineers

Foundations for Buildings, Bridges and Dams; Tunnels, Bulkheads, Marine Structures; Soil Studies and Tests; Reports, design and supervision.

415 Madison Ave., New York 17, N.Y.
Eldorado 5-4800

Parsons, Brinckerhoff, Quade & Douglas

ENGINEERS

Bridges, Highways, Tunnels, Airports, Subways, Harbor Works, Dams, Canals, Traffic Parking and Transportation Reports, Power, Industrial Buildings, Housing, Sewerage and Water Supply.

165 Broadway New York 6, N. Y.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names — **Additional cards on preceding and following pages**

E. Lionel Pavlo

Consulting Engineer

Design, Supervision, Reports
Bridges, Highways, Expressways
Marine Structures, Public Works
Industrial Construction, Airports

642 Fifth Ave. New York 19, N. Y.

Malcolm Pirnie Engineers

Malcolm Pirnie — Carl A. Arenander
Ernest W. Whitlock — Malcolm Pirnie, Jr.
Robert D. Mitchell — Alfred C. Leonard

MUNICIPAL AND INDUSTRIAL
Water Supply—Water Treatment
Sewage and Waste Treatment
Drainage—Rates—Refuse Disposal

25 West 43rd St. New York 36, N. Y.

The Pitometer Associates

Engineers

Water Waste Surveys
Trunk Main Surveys
Water Distribution Studies
Water Measurements & Special
Hydraulic Investigations
New York, 50 Church St.

Alexander Potter Associates

Consulting Engineers

Water Works, Sewerage, Industrial Waste, Hydraulic Works, Reports, Designs, Appraisals.

50 Church St., New York, N. Y.

Clyde Potts Assoc.

Weston Gavett - Stanley N. Williams
Consulting Sanitary Engineers
Sewerage and Sewage Disposal
Water Works and Water Supply
Valuations and Appraisals

203 Park Ave., Plainfield, New Jersey

Praeger-Kavanagh

Engineers

126 East 38th St., New York 16, N. Y.

Seelye Stevenson Value & Knecht

Consulting Engineers

Richard E. Dougherty, Consultant

Airports, Highways, Bridges, Dams, Water Supply, Sanitation, Railroads, Piers, Industrial Plants, Reinforced Concrete, Steel, Industrial Waste Disposal, Foundations, Soil Studies, Real Estate Development
Civil — Mechanical — Electrical

101 Park Avenue New York 17, N. Y.

Severud-Elstad-Krueger-Associates

Consulting Engineers
Structural Design - Supervision
Reports - Buildings - Airports
Special Structures

415 Lexington Ave., New York 17, N.Y.

YOU TOO

can use the services of the consulting firms listed on these pages. They represent a great and varied collection of specialized talents.

USE THEM TO

Supply talents and specialties not existing in your organization
Obtain authoritative outside checks on your own findings and conclusions
Provide neutral and impartial opinion when there might be a difference of opinion in your company.
Take full advantage of the progress and mistakes made by others
Ease the present—and continuing —shortage of engineers
Secure social services that would not warrant full time employment
Do a hundred and one different jobs for you

Singstad & Baillie

Consulting Engineers

Ole Singstad — David G. Baille, Jr.
Tunnels, Subways, Highways
Foundations, Parking Garages

24 State St. New York 4, N. Y.

Frederick Snare Corporation

Engineers—Contractors

Harbor Works, Bridges, Power Plants, Dams, Docks and Terminals.

Difficult and Unusual Foundations A Specialty.

233 Broadway, New York City 7

Havana, Cuba — Lima, Peru
Bogota, Columbia, Caracas, Venezuela

Steinman, Boynton, Gronquist & London

Consulting Engineers

HIGHWAYS - BRIDGES - STRUCTURES

117 Liberty St., New York 6, N. Y.

Tippetts-Abbett-McCarthy-Stratton

Engineers and Architects

Ports, Harbors, Flood Control, Power Dams, Bridges, Tunnels, Highways, Railroads, Subways, Airports, Traffic, Foundations, Water Supply, Sewerage, Reports, Design, Supervision, Consultation.

375 Park Avenue, New York 22, N. Y.

Arnold H. Vollmer Associates

Consulting Engineers

Highways, Parks, Bridges, Municipal Improvements, Public Works, Reports, Surveys, Contract Plans.

25 W. 45th Street, New York 36, N. Y.
Telephone: CIrcle 7-6250

Lawrence S. Waterbury

Consulting Engineer

Bowling Green 9-9298
26 Broadway New York 4

Keis & Holroyd

Consulting Engineers

Formerly Solomon & Keis
Since 1906
Water Supply, Sewage Disposal, Garbage & Refuse Incineration, Industrial buildings.
Troy, N. Y.

Royal Contracting Corporation

Mud-Jacking, Drilling & Grouting Specialists

Box 141, Bridgeport, Pa.
(Montgomery Co.)
Ph. BRoadway-2-5891

Capitol Engineering Corporation

Engineers—Constructors—Management

Bridges — Dams
Planning — Airports
Sewage Systems — Water Works
Design and Surveys — Roads & Streets
Executive Offices, Dillsburg, Penna.

Gannett Fleming Corddry & Carpenter, Inc.

ENGINEERS

Dams, Water Works, Sewage, Industrial Wastes & Garbage Disposal, Highways, Bridges & Airports Traffic & Parking — Appraisals, Investigations & Reports,

Harrisburg, Penna.

Branch Offices
Pittsburgh, Pa. Philadelphia, Pa.
Daytona Beach, Fla.

Modjeski and Masters

Consulting Engineers

Bridges and other Structures
Foundations
Highways and Expressways

900 North Sixth St. Harrisburg, Pa.
Philadelphia - Miami - New Orleans

Albright & Friel Inc.

Consulting Engineers

Water, Sewage, Industrial Wastes and Incineration Problems, City Planning Highways, Bridges and Airports, Dams, Flood Control, Industrial Buildings, Investigations, Reports, Appraisals and Rates

3 Penn Center Plaza Phila. 2, Pa.

Lawrence T. Beck and Associates

ENGINEERS AND CONSULTANTS

Philadelphia New York Washington

Fridy, Gauker, Truscott & Fridy, Inc.

Architects & Engineers

Water, Sewer, Waste Disposal, Roads, Airports, Power & Lighting, Petroleum Facilities, Hospitals, Schools, Public & Industrial Buildings, Reports, Plans, Supervision, Appraisals.

1321 Arch St. Philadelphia 7, Pa.

Harris-Dechant Associates

Consulting Engineers

Water Supply, Dams, Stream Improvement, Flood Control, Port & Harbor Development; Sanitary & Industrial Wastes; Hydro & Steam Power; Highway Engineering & Design.
Surveys;—Reports—Economics

123 S. Broad St., Philadelphia 9, Pa.

The Kuljian Corporation

Engineers • Constructors

WE DESIGN AND CONSTRUCT

Power Plants • Public Works • Processing Plants • Oil Refineries • Chemical Plants • Textile Plants • Airport Facilities • Military Installations

1200 N. Broad St., Philadelphia 21, Pa.

Yule, Sticklen, Jordan & McNee

ENGINEERS

Bridges, Highways, Airports
Design, Investigations, Reports
Supervision of Construction
Civil, Structural Mechanical & Electrical

Cedar Cliff Drive
Camp Hill, Pa.

1225 Vine Street
Philadelphia 7, Pa.

5564 North High Street
Columbus, Ohio

CONSULTANTS!

This section provides you with a dignified, ethical means of presenting your specialized services to key men in engineering.

Justin & Courtney

Consulting Engineers

Joel B. Justin - Neville C. Courtney
Dams and Power Problems, Hydroelectric, River Basin Developments, Water Supply, Foundations.

121 South Broad Street
Philadelphia 7, Pa.

Hunting, Larsen & Dunnells,

Engineers

Industrial Plants — Warehouses, Office and Commercial Buildings, Steel and Reinforced Concrete. Design and Supervision, Reports.

1150 Century Bldg., Pittsburgh, Pa.

Morris Knowles Inc.

Engineers

Water Supply and Purification Sewerage and Sewage Disposal, Valuations, Laboratory, City Planning.

Pittsburgh, Pa.

Peter F. Loftus Corporation

Design and Consulting Engineers

Electrical • Mechanical • Structural
Civil • Nuclear • Architectural
First National Building
Pittsburgh 22, Pennsylvania

Pennsylvania Drilling Company

Subsurface Explorations, Grouting, Industrial Water Supply, Mineral Prospecting.
Large Diameter Drilled Shafts, Reports

1205 Chartiers Ave. Pittsburgh 20, Pa.

Michael Baker, Jr., Inc.

Consulting Engineers, Civil Engineers, Planners & Surveyors; Airports & Highway Design; Water Works & Sewerage Design & Operation; Aerial Topo Maps; Surveys; Reports & Investigations; Irrigation. Home Off.—Rochester, Pa. Br. Off.; Jackson Miss.; Harrisburg, Pa.; College Park, Md.

Sprague & Henwood, Inc.

Drilling Services

Foundation Investigations, Soil Testing & Test Borings, Grout Hole Drilling & Pressure Grouting, Diamond Core Drilling

Main Office
221 W. Olive Street, Scranton, Pa.

Branches:
1009 Western Savings Fund Bldg., Philadelphia, Pa.
11 W. 42nd St., New York, New York
345 Mt. Lebanon Blvd., Pittsburgh 34, Pa.
Box 1446—Grand Junction, Colorado
Atlanta, Ga.
Buchans, Newfoundland

Frank D. McEnteer's Associates, Inc.

Consulting Engineers

Bridges, Highways, Industrial Plants
Design, Investigations, Surveys
Terminal Building, Clarksburg, W. Va.

SOUTH

Dames & Moore

Consultants in
Applied Earth Sciences
Soil Mechanics — Engineering Geology
Geophysics

Chicago • New York • San Francisco
Los Angeles • Portland • Seattle
Atlanta • Salt Lake City

Harry Hendon & Associates, Inc.

Engineers

Civil Engineers—Public Utilities
Investigations—Designs
Supervision of Construction

P. O. Box 2221 — 925 Sligh Blvd.
Birmingham 1, Ala. — Orlando, Florida

THIS SECTION is available to consulting engineers to contact prospective clients every week or every other week.

CONSULT THESE SPECIALISTS . . .

when you need professional assistance in solving difficult problems. Their specialized knowledge and broad experience can prove invaluable in saving both time and money for you.

Engineering News-Record invites other consultants to list the special services they offer on these pages.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names — **Additional cards on preceding and following pages**

Palmer and Baker Engineers, Inc.

Consulting Engineers - Architects

Surveys-Reports-Design-Supervision Consultation

Transportation and Traffic Problems
Tunnels-Bridges-Highways-Airports
Industrial Buildings
Waterfront and Harbor Structures
Graving and Floating Dry Docks
Complete Soils, Materials and Chemical Laboratories

Mobile, Ala. New Orleans, La.
Washington, D. C.

Rader and Associates

Engineers - Architects

Sewage Disposal, Water Works, Ports, Airports, Bridges, Highways, Office and Commercial Buildings, Industrial Plants, Reports, Investigations, Consultations, Aerial Photography, Photogrammetry.

First Natl. Bank Bldg., Miami 32, Fla.

J. Stephen Watkins

Consulting Engineers

Highways—Bridges—Sewerage
Water Supply—Industrial Plants

446 E. High St., Lexington, Kentucky
5402 Preston Highway, Louisville, Ky.
107 Hale St., Charleston, W. Va.

Eustis Engineering Company

FOUNDATION AND SOIL
MECHANICS INVESTIGATIONS

Soil Borings *Laboratory Test*
Foundation Analyses *Reports*

3635 Airline Highway
Metairie, Louisiana

Schmidt Engineering Co. Inc.

Consulting Engineer

Investigations, Reports, Designs, Supervision Heavy Construction—Dams and Hydroelectric Projects—Foundation Explorations and Treatment—Water and Sewerage Works—Bridges & Highways

Emerson Building Chattanooga, Tenn.

ETCO Engineers and Associates

Foundation Consultants

Test Borings Laboratory Tests
Recommendations, Design and Supervision

2116 Canada Dry St., Houston 23, Tex.
727 Main St. Baton Rouge, La.
427 Carondelet St., New Orleans 12, La.

Mott Core Drilling Company

Core Borings for Buildings, Bridges Foundation Soil Tests, Highways Pressure Grouting, Dams, Mine Shafts Mineral Prospecting

826-846 Eighth Ave, Huntington, W. Va.

MIDDLE WEST

Alvord, Burdick & Howson

CONSULTING ENGINEERS

Water Works — Sewerage
Water Purification — Sewage Treatment
Flood Relief — Power Generation
Drainage — Appraisals

20 North Wacker Drive, Chicago

CONSULTANTS!

This section provides you with a dignified, ethical means of presenting your specialized services to key men in engineering.

Ralph H. Burke, Inc.

CONSULTING ENGINEERS

Complete Architectural and Engineering Services
Plans, Supervision, and Reports

Expressways - Grade Separations
Traffic Studies - Parking Structures
Underground Garages - Shore Protection
Parks - Field Houses - Municipal Works
Airports and Air Terminal Buildings

20 North Wacker Drive, Chicago 6, Ill.

Consoer, Townsend & Associates

Consulting Engineers

Sewage treatment, sewers, storm drainage, flood control—Water supply and treatment—Highway and bridges—Airports—Urban renewal—Electric and gas transmission lines—Rate studies, surveys and valuations—Industrial and institutional buildings.

360 East Grand Ave. Chicago 11, Ill.

De Leuw, Cather & Company

CONSULTING ENGINEERS

Public Transit — Subways
Traffic & Parking — Railroad Facilities
Expressways — Industrial Plants
Grade Separations — Municipal Works
Urban Renewal — Port Development

150 North Wacker Drive, Chicago 6
San Francisco Toronto Boston

Harza Engineering Co.

Consulting Engineers

Calvin V. Davis E. Montford Fuelk
Richard D. Harza

Hydroelectric Plants & Dams
Transmission Lines
Flood Control, Irrigation
River Basin Development

100 West Madison Street Chicago 6

Greeley and Hansen

Engineers

Water Supply, Water Purification
Sewerage, Sewage Treatment
Flood Control, Drainage, Refuse Disposal
14 E. Jackson Boulevard
Chicago 4, Illinois

Hazelet & Erdal

CONSULTING ENGINEERS

Fixed & Movable Bridges, Expressways, Industrial Plants, Airports, Dams.
Monadnock Block, Chicago 4, Ill.
Dixie Terminal Bldg., Cincinnati 2, O.
Commerce Bldg., Louisville 2, Ky.
Oding Bldg., Lansing 33, Mich.

Pioneer Service & Engineering Co.

Consulting and Design Engineers
Operations - - - Purchasing
Steam - - Hydraulic - Gas
Public Utilities - - Industrials

231 So. La Salle St. Chicago 4

REMEMBER!!

You can depend on these consultants for a fast accurate solution to your problems. Consult them when necessary.

Sargent & Lundy

ENGINEERS

Consultants to the Power Industry

Studies • Design • Supervision
140 South Dearborn Street
Chicago 3, Ill.

Soil Testing Services, Inc.

Soil Investigations, Laboratory Testing Engineering Reports & Recommendations

1827 N. Harlem Ave., Chicago 35, Ill.

Suhr, Peterson, Peterson & Suhr

Consulting Engineers

REPORTS—PLANS—SUPERVISION
Sewerage, Water Supply, Flood Control & Drainage, Airports, Roads, Surveys
Fixed & Movable Bridges

130 N. Wells St., Chicago 6, Ill.
P. O. Box 1858, Anchorage, Alaska

Chas. W. Cole & Son

Engineers and Architects

3600 E. Jefferson Blvd.
South Bend, Indiana

2112 W. Jefferson St.
Joliet, Illinois

The Hinchman Corporation

Consulting Engineers

"WORLD-WIDE ACTIVITIES"
Survey • Design • Supervision
Specializing In
Corrosion Control•F.C.C. Certification Tests
Electromagnetic Interference Studies
Francis Palms Bldg., Detroit, Michigan

The H. C. Nutting Company

Testing Engineers—Inspection Service
Foundation Investigation—Test Borings
Soil Mechanics—Sewage Flows
Construction Control—Concrete
Water Waste Survey

4120 Airport Road Cincinnati 26, O.

The Austin Company

Design and Construction
Manufacturing and Process Plants
Newspaper and Broadcasting Bldgs.
Power Plants—Industrial & Institutional
Industrial Office Buildings and Laboratories
Merchandising Bldgs. & Facilities
Plant Location Surveys

New York CLEVELAND Los Angeles
Chicago Houston Oakland
Detroit Seattle

Havens and Emerson

A. A. Burger, H. H. Moseley, J. W. Avery, F. S. Palocsay, E. S. Ordway, A. M. Mock, G. H. Applanalp, S. H. Sutton
Frank C. Tolles, Consultant
Water, Sewerage, Garbage, Industrial Wastes, Valuation—Laboratories

Leader Bldg. Woolworth Bldg.
Cleveland 14 New York 7

The Osborn Engineering Co.

DESIGNING-CONSULTING

Industrial Plants — Office Buildings
Stadiums — Grand Stands — Field Houses
Bridges — Garages — Laboratories

7016 Euclid Ave. Cleveland 3, Ohio

Rackoff Associates

Engineers

Highways, Expressways, Bridges, Sewerage and Water Systems, Fiscal and Master Planning, Investigations, Urban Renewal, Supervision

1033 W. Third Ave., Columbus, Ohio
Plaza Bldg., Pittsburgh 19, Pa.

Jones, Henry & Williams

Consulting Sanitary Engineers

Water works Sewerage & Treatment
Waste Disposal

2000 W. Central Ave., Toledo 6, Ohio

Toledo Testing Laboratory

Engineers—Chemists

Concrete—Soils—Asphalt
Inspection — Research
Tests — Development
Foundation Investigation
Borings—Diamond Drilling
Load Tests
Soils Mechanics Laboratory

1810 North 12th St. Toledo 2, Ohio

WEST OF MISSISSIPPI

Heron Engineering Co.

Consulting Engineers

For all types of Aerial Tramways, Cableways, and Suspended Structures

2000 South Acoma St.
Denver 23, Colorado

Stanley Engineering Company

Consulting Engineers

Hershey Building 208 S. LaSalle St.
Muscatine Ia. Chicago 4, Ill.

Bucher & Willis

Consulting Engineers

Highways, Bridges, Structures, Planning Reports, Supervision and Investigations

Box 583,
1412 W. 47st St. 625 E. Crawford
Kansas City, Missouri Salina, Kansas

Black & Veatch

Consulting Engineers

Water - Electricity - Sewage - Gas - Industry - Reports, Design, Supervision of Construction, Investigations, Valuation and Rates.

1500 Meadow Lake Parkway
Kansas City 14, Missouri

Burns & McDonnell

Engineers—Architects—Consultants

4600 E. 63rd St. Trafficway
Kansas City 41, Missouri

Russell and Axon

Consulting Engineers

Civil — Sanitary — Structural
Industrial — Electrical
Rate Investigations

408 Olive St. St. Louis 2, Mo.
Municipal Airport, Daytona Beach, Fla.

Sverdrup & Parcel Engineering Co.

Engineers—Architects

Bridges, Structures and Reports, Industrial and Power Plant Engineering

915 Olive St., St. Louis 1, Mo.
417 Montgomery St., San Francisco, Calif.

CHECK

this section whenever you need professional advice.

When you need a SPECIALIST in a hurry . . .

Engineering News-Record's Professional Service Section offers the quickest most direct method of contacting consultants who may be available NOW.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names — **Additional cards on preceding pages**

Benham Engineering Company

Established in 1909
Design and Consulting Engineers
215 N E 23rd Street
Oklahoma City 5, Oklahoma

Spencer J. Buchanan and Associates, Inc.

Consulting Engineers
Soil Mechanics and Foundation Engineering. Civil Engineering Services. Reports, Design and Field Supervision.
310 Varisco Building, Bryan, Texas
TAylor 2-3767

Soil Mechanics Incorporated

Foundation Exploration and Testing Services
Site Investigations, Soil Borings, Field and Lab Testing, Load Tests, Reports
310 Varisco Building, Bryan, Texas
TAylor 2-3767

Lockwood, Andrews & Newnam

Consulting Engineers
Navigation Facilities — Public Works Airports — Earthworks — Roads, Structural, Mechanical — Electrical Reports — Design — Supervision Surveys — Valuations
Corpus Christi—Houston—Victoria, Texas.

FAR WEST

International Engineering Company, Inc.

ENGINEERS
Investigations - Reports - Design
Procurement - Field Engineering
Domestic and Foreign
74 New Montgomery St.
San Francisco 5, California

Jacobs Associates

Consulting Construction Engineers
TUNNELS—DAMS
EARTHMOVING—FOUNDATIONS
Methods, Cost Estimates, Plant Design, Management, Surveys, Engineering Geology, Materials Handling
503 Market St., San Francisco 5, Calif.

Wisser & Cox

APPLIED GEOLOGY
FOR
SURFACE AND UNDERGROUND STRUCTURES
investigations - consultations
55 New Montgomery
San Francisco, California
YUken 2-1436 Cables: GEOLOG

Professional Assistance

in solving your most difficult problems is offered by consultants whose cards appear in this section.

Nevada Testing Laboratories, Ltd.

Engineering—Civil—Soils & Foundation Consultants—Field Testing—Soil Borings — Rock Drilling — Materials Field Control—Load Tests—Laboratory Testing—Soils—Concrete—Asphalt
300 W. Boston Ave. Las Vegas, Nev.

FOREIGN

Puerto Rico Testing Services, Inc.

Soils and Foundation Consultants
Borings-Laboratory Tests-Supervision
Concrete—Materials—Designs—Reports
P.O. Box 588
Roosevelt (San Juan) Puerto Rico

Underpinning and Foundation Co. of Puerto Rico

Pile driving, caissons, underpinning, all types of foundations, industrial and commercial construction, sewers and sewage disposal.
800 Labra Ave. — Santurce, P. R.
Phone: 3-1040

ALWAYS READY

Yes, these consultants are always ready to help you with any problem concerning engineered construction. Call on them with the assurance that you will be receiving the finest professional service.

INSPECTION & TEST

Robert W. Hunt Company

Inspection and Testing of Engineering Materials & Equipment
General Offices and Laboratories
810 South Clinton Street, Chicago 7, All Principal Cities

Johnson Soils Engineering Laboratory

Foundation Design - Highway & Airport Pavements - Construction Control - Load Tests - Shear & Consolidation Tests - MOBILE LABORATORIES
193 West Shore Ave., Bogata, N. J.
Bogata-Hubbard 7-4408

Pittsburgh Testing Laboratory

A national service with complete laboratory and inspection facilities.
Laboratories in principal cities.
Main Office: 1339 Locust St., Pittsburgh, Pa.

Law Engineering Testing Company

Soils Engineers & Consultants
Soil Testing — Soil Boring — Rock Drilling—Load Testing—Field Control —Engineering Studies—Chemical Analysis—Physical Testing
Box 1558 Atlanta 1 Ga.
Serving the entire South

AERIAL SURVEYS

Aerial Map Service Co.

Topographic, Planimetric, Photo Maps for Highways, Mining, Resources, Construction. City Maps, Tax Maps, Photo Geology, Tellurometer Radio Distance Measurements, Triangulation, Electronic Computation.
1016 Madison Ave., Pittsburgh 12, Pa.

American Air Surveys, Inc.

AERIAL TOPOGRAPHIC MAPS & AERIAL PHOTOS FOR
• Highways • Airports • Power & Pipe Lines • Railroads • Mining • All types construction • Stockpile Inventories
907 Penn Ave. Pittsburgh 22, Pa.
A NATIONWIDE SERVICE

Clyde E. Williams & Assoc., Inc.

Aerial Photos - Enlargements - Topographic Maps
At large and particular scales to suit various engineering needs, e. g. Airports, City Sewer & Water, Power & Pipe lines, Reservoirs, Subdivisions, Highways, Bridges & Inventories.
312 W. Colfax Ave. South Bend, Ind.

GEOLOGISTS

Geologic Associates

ENGINEERING GEOLOGISTS
Studies and Reports
Foundation Investigations
Specialized Drilling and Sampling
Brentwood, Tennessee
Phone (Nashville) VErnon 2-1748

John R Rand Incorporated

Geologic Consulting
Geologic-geophysical investigations for dams, tunnels, highways, light and heavy construction, water supply, earth materials, aggregates, mineral deposits and mineral exploration.
67 State Street Augusta, Maine

Quick

solutions to your technical problems are available through these consultants. Think first of the Professional Services Section of your publication when considering calling in an expert.

CONSULT THESE SPECIALISTS . . .

When you need professional assistance in solving difficult problems. Their specialized knowledge and broad experience can prove invaluable in saving both time and money for you.

Engineering News-Record invites other consultants to list the special services they offer on these pages.

Rates for the Professional Services section are:

	PER WEEK		
	13 times	26 times	52 times
¾"—$14.35	$13.35	$12.45	
1½"—$23.85	$22.30	$21.00	

SEARCHLIGHT Equipment Locating Service

This service is aimed at helping you, the reader of "SEARCHLIGHT", to locate Surplus new and used Engineering and Construction equipment not currently advertised. (This service is for USER-BUYERS only). No charge or obligation.

How to use: Check the dealer ads on pages 124, 125 and 126 to see if what you want is not currently advertised. If not, send us the specifications of the equipment wanted on the coupon below, or on your own company letterhead to:

Searchlight Equipment Locating Service
c/o ENGINEERING NEWS-RECORD
P.O. Box 12, New York 36, New York

Your requirements will be brought promptly to the attention of the equipment dealers advertising in this section. You will receive replies directly from them.

Searchlight Equipment Locating Service
c/o ENGINEERING NEWS-RECORD
P.O. Box 12, New York 36, N. Y.

Please help us locate the following equipment: .....

.....

NAME ..... TITLE .....

COMPANY ..... STREET .....

CITY ..... ZONE ..... STATE .....

5/12/60

ADVERTISERS IN THIS ISSUE

Aetna Casualty & Surety Co. 61
Allis-Chalmers 99; 101
American Bitumuls & Asphalt Co. 86
American Bridge Div., United States Steel Corp. 84
American Foreign Insurance Association 40
American Pipe and Construction Co. ..3rd Cover
The Arcair Co. 100
Arkwright Finishing Division 72
Armco Drainage & Metal Products, Inc. 66-67

Bethlehem Steel Co. 56
Charles Bruning Co., Inc. 63
Butler Bin Company 94
A. M. Byers Company 71

Cast Iron Pipe Research Association 42-43
Chicago Bridge & Iron Company .....2nd Cover
Chicago Pneumatic Tool Company 113
Cleveland Tramrail Div., Cleveland Crane & Engineering Co. 88
Clyde Iron Works, Inc. 41
The Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div. 6
Concrete Plant Mfgrs. Bureau 95
Concrete Reinforcing Steel Institute 78

The Deming Co. 104
Dewey & Almy Chemical Co. 105
Diesel Energy Corp. 55
Dodge Manufacturing Corporation 90
Dorr-Oliver, Inc. 83
Richard Dudeon Inc. 131

Eastman Kodak Company 79
Elgood Concrete Forms, Corp. 104
Esso Standard Oil 114
Euclid Div., General Motors Corp. 58-59

Fennel Instrument Corp. of America 85
Michael Flynn Mfg. Co. 92-93

The Goodyear Tire & Rubber Co., Truck Tires Dept. 7
Griffin Wellpoint Corp. 78

Harnischfeger Corporation 30-31
Hose-McCann Telephone Co., Inc. 83
Hyster Company 68

Igloo Corporation 11
Industrial Tubular Equipment Company 70

Jenkins Bros. 35
C. S. Johnson Company 15

Keuffel & Esser Co. 9
Walter Kidde & Co., Inc. 60
Koehring Division 14

Layne & Bowler, Inc. 10
Lefax Publishers 131
Leschen Wire Rope Div., H. K. Porter Co., Inc. 82
R. G. LeTourneau, Inc. 108
Liberty Mutual Insurance Company 16
Louisville Cement Co. 107

Manitowoc Engineering Corp. 47
Massey-Ferguson Industrial Division 110
Mayo Tunnel & Mine Equipment 104
McGraw-Hill Book Co., Inc. 69; 98
Moretrench Corporation 20
Mueller Co. 12-13
Murphy Diesel Company 1

National Lead Company 65
Naylor Pipe Company 48
Northwest Engineering Co. 3

Ozalid Div., General Aniline & Film Corp. . 74

Pittsburgh-Des Moines Steel Company 29
Portland Cement Association 81

Republic Steel Corporation 76-77
Joseph T. Ryerson & Sons, Inc. 18

Shlagro Steel Products Corp. 62
A. O. Smith Corp., Permaglas Div. 100
Socony Mobil Oil Co., Inc. 8
Sonoco Products Company 96-97

John W. Stang Corp. 70
Stow Manufacturing Co. 46
Sylgab Steel & Wire Corp. 64
Symons Clamp & Mfg. Co. 2

Texaco Inc. 4-5
The Timken Roller Bearing Co. .....4th Cover

United States Fidelity & Guaranty Co. 73
U. S. Pipe & Foundry Company 116-117
U. S. Rubber Co., Tire Div. 103
U. S. Steel Corp. 87
Universal Form Clamp Co. 106

Vibroflotation Foundation Co. 80

Westinghouse Electric Corp. Apparatus Div. 51-54
Worthington Corp. 36-37

Yeomans Brothers Co. 34
Yuba Consolidated Industries, Inc. 102

Professional Services 127-130

CLASSIFIED ADVERTISING
F. J. Eberle, Business Mgr.

Employment Opportunities 121-123
Notices
Proposals 119-121
Equipment
(Used or Surplus)
(For Rent, Sales Wanted).....124-126

ENGINEERING NEWS-RECORD

330 West 42 St., New York 36—LOngacre 4-3000

ABP Member ABC

Number of copies of this issue printed 86,204

D. S. ROBERTSON, Advertising Sales Manager
HUGH J. CARLSON, Assistant Business Manager

ADVERTISING REPRESENTATIVES

Atlanta, 3—Rhodes-Haverty Bldg., Robert H. Powell, Jr.

Chicago, 11—520 No. Michigan Ave. L. H. Hunt, W. G. Payne, Earl S. Moore, Jr.

Cleveland, 13—1164 Illuminating Bldg., 55 Public Square H. A. Bergstrom, F. P. DiToro

Dallas, 1—Vaughn Bldg., 1712 Commerce St., Robert T. Wood

Denver, 2—Tower Building, 1700 Broadway J. W. Patten

Detroit, 28—Penobscot Bldg., R. I. Mace

Los Angeles, 17—1125 W. Sixth St., Knox Bourne, S. S. Tiebout

New York, 36—500 5th Ave. C. D. Neulen, H. T. Olsen Robert L. Barker

Philadelphia, 3—Six Penn Center Plaza D. G. Jensen Patrick Keleher

Pittsburgh, 22—1111 Oliver Bldg., Malcolm Russell

St. Louis, 8—Continental Bldg., E. B. Mingle, Jr.

San Francisco, 4—68 Post St. John J. Hernan

OTHER SALES OFFICES:

Boston 16—350 Park Square Bldg., United Kingdom, Edward E. Schirmer, 95 Farringdon St., London E.C. 4.—Germany, Austria, Stan Kimes, 85 Westendstrasse, Frankfort/Main, Germany—Switzerland, Italy, France and Belgium, Michael R. Zeynel, 2 Place du Port, Geneva, Switzerland

TECHNICAL DATA

FOR ENGINEERS TEACHERS · STUDENTS TECH. WORKERS

LOOSELEAF POCKET SIZE BOOKS $1.25 ea.

Loose leaf, 6 hole, 6¾"x3¾" bond paper, each book approx. 140 pages of technical data.

Architecture	General Math	Phys. & Thermo. Data
Home Heating	Math Tables	
Illumination	Physics	Metals
Electrician's Data	Trig-Log Tables	Metallurgy
Builder's Data	Gen'l Chemistry	Hydraulics
Lumber Data	Chemical Tables	Radio
Air Conditioning	Analytic Chem.	Television & FM
Building Constr.	Mech'l Drawing	Electricity, AC
Reinf. Concrete	Machine Design	Electricity, DC
Piping Data	Machinist's Data	AC Motors & Gen'trs.
Surveying	Mech. of Materials	
Surveying Tables	Pwr. Trans. Mach.	Transformers
Highway Eng'g.	Thermo. Tbls.	Relays & Meters

Write for FREE catalogs (2000 listings). Send $1.25 for each book or $6 for any five books to LEFAX PUBLISHERS, Dept. EN-50, Phila. 7, Pa.

DUDGEON HYDRAULIC JACKS

SALES RENTALS

• CAPACITY TO 600 TONS

FOR:
PILE TESTING
•
UNDER-PINNING
•
BRIDGES
•
PIPE PUSHING
•
SOIL TESTING

Write to Dept. R

RICHARD DUDGEON INC.

789 BERGEN ST. • ST 9-4040 • BROOKLYN, N. Y.

"NEITHER RAIN NOR SNOW NOR DARK OF NIGHT . . . ."

But often forgetting the postal zone number when you address an envelope can delay your letter long enough to miss the appointed round. There are 106 cities in America where a complete address includes a zone number. Always use it when writing to or from these cities.

Editorials

Shapes to Come

THE SPECTACULAR USE OF circular tubes in the new Askero Fjord bridge, Sweden, (ENR May 5, p. 34), may lead many U.S. engineers to wonder why such sections are not used more widely for structural framing in this country. And in view of recent advances in analytical tools, as well as in fabrication and erection methods and connectors, it may well be that these and other special shapes may prove to offer more advantages now than they have heretofore.

Circular cross sections have always had some appeal in structural applications. They offer the least area for a given perimeter, a constant moment of inertia about all axes through the center and favorable aerodynamic characteristics. In particular, circular tubes make efficient use of material in resisting buckling and torsion. However, they offer no economic advantages over other common shapes in carrying tension, and are not as efficient as wide-flange sections in resisting bending.

Steel tubes were used for the 912-ft arch ribs and the deck columns of the Askero bridge to take advantage of their favorable geometric properties for compression members. In Europe, there is precedent for such long-span applications of tubular sections going back more than a century—the 455-ft truss spans with tubular compression chords at Saltash, England, for example (ENR July 9, 1959, p. 43). Scotland's old Firth of Forth Bridge (1890), of cantilever truss construction, with main span of 1,700 ft, is another example.

In Europe, also, there are extensive applications of circular tubes for shorter spans, especially in buildings. They are used for roof trusses, domes and arches. And they serve as columns in a new 24-story office building in Dusseldorf, Germany.

In contrast, hollow circular steel sections, once popular in the U.S. at the turn of the century, now are used principally for low, lightly loaded buildings and scaffolding, although they have also been used in recent years for such impressive structures as TV towers of record-breaking height, for columns of elevated water tanks and for legs of Texas towers. More widespread use has probably not occurred because of the difficulty of connecting circular shapes with rivets or bolts and because of the availability of relatively low-cost, standardized rolled sections—H and I shapes, channels and angles—which are easy to connect.

Now, however, with modern welding and cutting techniques, fabrication of tubular sections is not excessively expensive and connections are much less of a problem. It is for this reason that a new look at the possibilities offered by such shapes may be worthwhile. The same may be said for other sections that recent developments have made practical—unsymmetrical shapes for steel-concrete composite beams, corrugated or folded-plate sections (similar to those used for recent light-gage aluminum bridges) and hat shapes that might be adapted to orthotropic-plate designs. Members with tapered flanges as well as tapered webs are worthy of study, too.

All in all there would seem to be many opportunities for imaginative engineers to explore in the field of structural shapes.

County Engineering Neglected

RURAL COUNTIES in the United States, of which there are several thousand, are, broadly speaking, in need of better engineering on their roads and bridges than they are getting. For one thing there has been a lack of interest on the part of consulting engineers in the relatively small county engineering problems. For another, counties have frequently placed too much reliance on aid and advice from the state highway departments, whose staffs are too busy with their own problems to give county matters more than cursory attention.

Probably most significant, however, is the belief on the part of county officials—sometimes elected boards of highway commissioners, sometimes county-court appointed committees—that good engineering advice is either too expensive or really unnecessary. What is needed, therefore, is to convince these officials that their counties not only can afford good engineering, but that it will result in better, more economical facilities. Since these officials are, by and large, public spirited businessmen and farmers anxious to serve their counties well, the task should not be an impossible one.

One way to attack this problem of education was demonstrated last fall by the Nashville Section of the American Society of Civil Engineers, which brought the matter to the attention of the county judges, who in Tennessee appoint committees to handle such things as new bridge projects. As a result, one county, which had previously merely hired a contractor to fit a standard state bridge to a site as best he could, engaged an engineer who prepared three alternate designs for a single site and put them out for competitive bids. The county got a bridge designed to fit a specific location, and the one of the three that was lowest in price. It also benefited from competent engineering inspection of the bridge while it was under construction.

County highways and bridges require more careful design and construction in these days of the motor car and truck than they did previously. Moreover, more of this work is in prospect than ever before, as the building of interstate and state highways across counties disrupts existing county road systems. Competent engineering will prove to be a good investment on all of this work. This fact should be impressed on county highway officials, whether by group action as in Tennessee or by individual engineers seeking to sell their services.

L O N G - T E R M E C O N O M Y

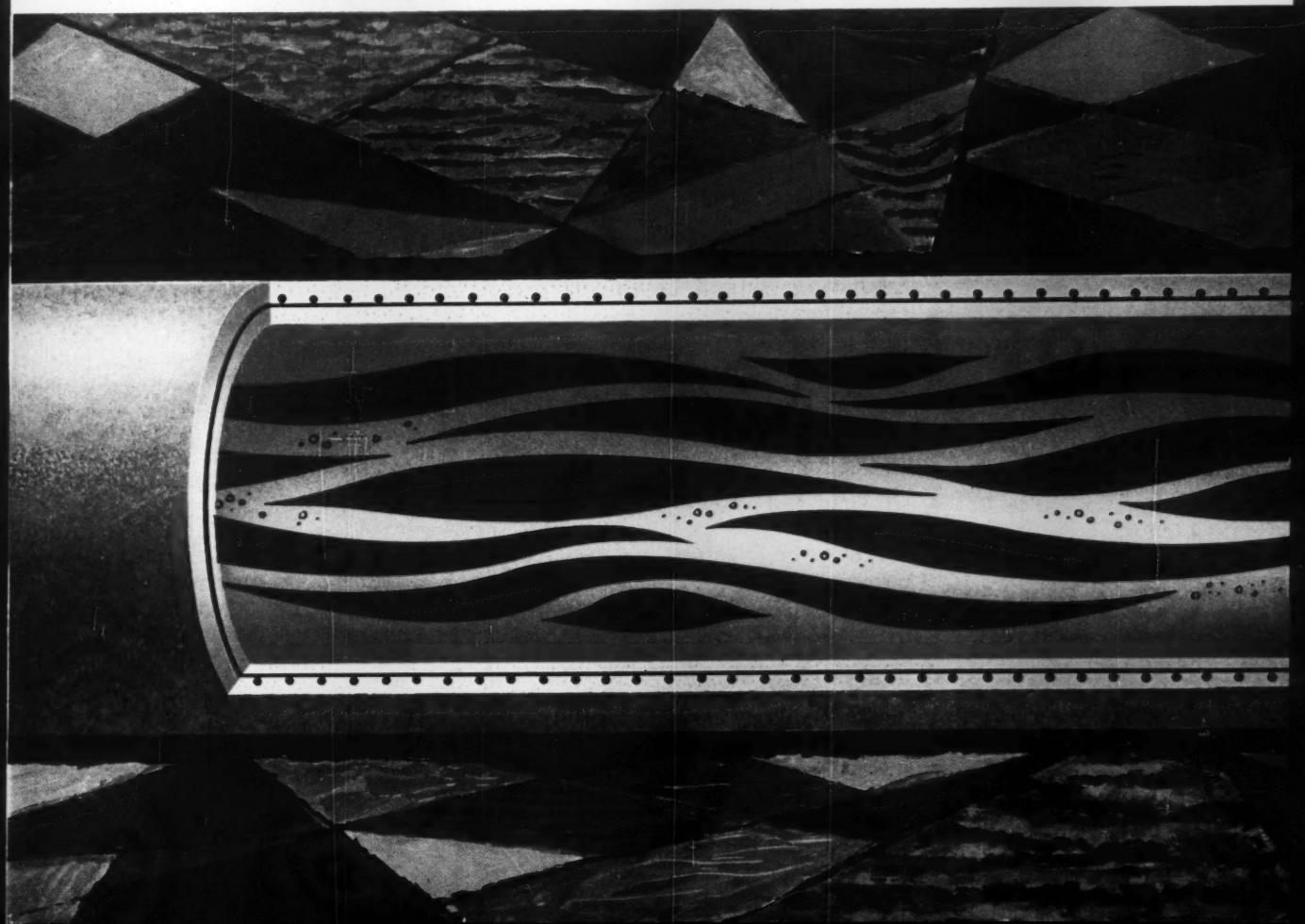
A Pipeline is for Moving Water

The long-term value of a pressure pipeline is in the predictable amount of water it will carry and continue to deliver. ■ American Concrete Cylinder Pipe excels in carrying capacity, and remains free of tuberculation. Test after test shows Hazen-Williams flow coefficients in excess of 140 can be expected in American Concrete Cylinder Pipe water supply and transmission lines. Generations of experience with high capacity pipelines have proved to users that these high flow capacities not only are maintained, but also tend to increase over years of service. ■ Take advantage of high flow characteristics, low pumping costs and other long-term economies of American Concrete Cylinder Pipe. See an American sales engineer when planning your next project.

American Pipe and Construction Co. • Los Angeles • San Diego • Hayward • Portland
Bogota, Colombia / **American Concrete Pipe Co. (subsidiary)** • Phoenix • Albuquerque

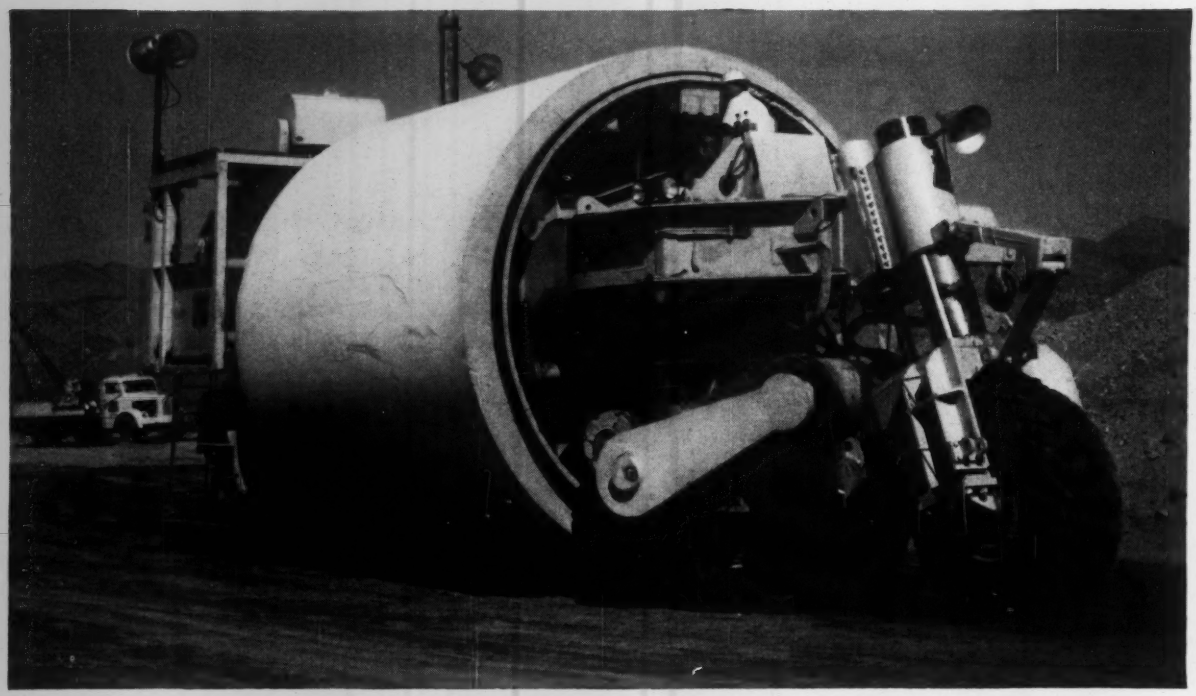
A MEMBER OF THE AMERICAN CONCRETE PRESSURE PIPE ASSOCIATION

American PIPE AND CONSTRUCTION CO.



80-ton machine rolls into pipe to win contract—

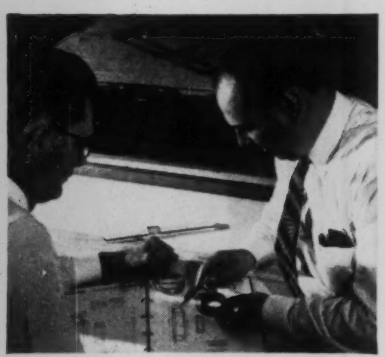
its Timken® bearings carry 12½ tons each



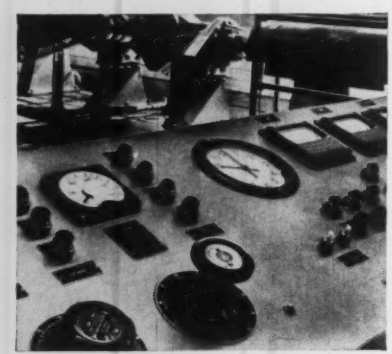
When American Pipe & Construction Company bid on siphons for the Metropolitan Water District of Southern California Colorado River Aqueduct expansion program, they had in mind a machine that could handle and install 68-ton sections of precase concrete pipe in trenches up to 50 feet deep and 125 feet wide at the top. The "Pipemobile" rolls into the pipe with its front wheel elevated, then "walks" onto that wheel, avoiding crushing the edge of the pipe. When it lifts the pipe, each of the six wheels, made by Kay-Brunner Steel Products, Inc., Los Angeles, carries about 25 tons.

To make sure the machine could handle these tremendous loads without breakdowns, Kay-Brunner mounted two Timken® tapered roller bearings in each wheel hub for adjustability and rigidity.

The full-line contact of Timken bearings gives them extra load-carrying capacity. Their precision manufacture from the finest bearing-quality alloy steel available enables them to stand up to enormous shocks. And because they're tapered, they can take all the loads—radial and axial and all combinations—of the "Pipemobile".



AT YOUR DRAWING BOARD. To make the most profitable use of bearing engineering—at your design stage—be sure your Timken bearing sales engineer is on hand.



GREATER CAPACITY at less cost is the goal of Timken Company research and testing. Equipment like the dynamometer above, helps turn these dreams into reality.

Industry rolls on

TIMKEN®

tapered roller bearings

The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO." *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.* Canadian Division: Canadian Timken, St. Thomas, Ont.